The Effectiveness of a Psychoeducational Intervention on Health Promoting Behaviors and Physical Health of Adult Patients (18 and over) on Antipsychotic Medications

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THE EFFECTIVENESS OF A PSYCHOEDUCATIONAL INTERVENTION ON HEALTH PROMOTING BEHAVIORS AND PHYSICAL HEALTH OF ADULT PATIENTS (18 AND OVER) ON ANTIPSYCHOTIC MEDICATIONS

Alice Opiyo Mwanda

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DEDICATION

To my dad, Alfred Mukuba who has been the wind beneath my wings. Special dedication to my immediate loving family, my husband Kennedy Mwanda, and my children Shannah, Sheila, Ann, and Nathan for all the sacrifices they made as I was completing my Doctoral education.
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ABSTRACT

Individuals on antipsychotic medications have been found to be disproportionately affected by overweight and obesity which increases their cardiometabolic risk. Psychoeducation has been found to be an effective strategy for risk reduction of cardiometabolic risks. This intervention examined the effectiveness of a psychoeducational intervention in adults (aged 18 and above) with severe mental illness. The four session, 8 week intervention encouraged an increase in fruit and vegetable intake and engagement in physical activity. The conceptual frameworks included the Health Promotion Model and Chronic Care Model. Outcome measures included nutrition, physical activity and health promoting behaviors. Biological outcomes included weight, BMI, blood pressure, pulse, waist circumference, and waist-hip ratio. The Health-Promoting Lifestyle Profile II (HPLP II) questionnaire was used to measure health promoting behaviors. The sample that completed the intervention consisted of 19 adults.

Results of paired sample t-tests indicate that at the end of the intervention there were significant changes in the fruit intake, vegetable intake and time spent engaged in physical activity. Twelve of the 19 participants lost weight at the end of the intervention. However, there were no significant statistical changes in any biological variable. Paired sample t-tests of the pre and post intervention 52 item HPLP II questionnaire indicated significant changes in the total 52 item scale, and physical activity and spiritual growth subscales. These findings suggest that an 8 week psychoeducational intervention can have an impact on the nutrition, physical activity and health promoting behaviors.
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For patients with schizophrenia, bipolar disorder, clinical depression, or other mental illnesses, the advent of psychotropic drugs improved the management of their symptoms and quality of life. Antipsychotic drugs, now in a second generation form, are an example of drugs that have helped people live better lives. Second generation antipsychotic medications (SGAs) also known as atypical antipsychotics have provided a clear benefit for many patients due to their reduced propensity to cause extrapyramidal effects often associated with older, conventional antipsychotics (Newcomer, 2004). However, adverse side effects have not evaded the use of antipsychotic drugs. A major concern for the use of many antipsychotic medications is their significant association with weight gain, obesity, which in turn increases cardiovascular risk (Fleischhacker et al., 2008; Maayan & Correll, 2010).

**Weight Gain Associated with Antipsychotic Medications**

A disproportionate burden of weight gain has been noted in patients who are taking antipsychotic medications. It has been indicated that none of the antipsychotic agents should be considered entirely body-weight-neutral, as the proportion of individuals who experience clinically significant weight gain (defined as >7% of pretreatment body weight) is greater with any antipsychotic agent than with placebo (Citrome, 2007). All antipsychotic drugs have been found to cause notable weight gain in patients who are taking these agents for the first time (Tarricone, Ferrari, Serretti, &
Berardi, 2010). The threat of weight gain has also been found to differ among different antipsychotic medications. For example, multiple controlled studies have shown that all SGAs are associated with weight gain compared with placebo treatment, although some, such as olanzapine, clozapine, and quetiapine are more problematic than others such as ziprasidone and aripiprazole (Das, Mendez, Jagasia, & Labbate, 2012).

Weight gain and obesity are increasingly becoming a growing public health concern facing Americans. It has been estimated that more than one-third of adults in the United States are obese (CDC, 2012). The escalation of various chronic medical conditions has also been attributed to obesity. Obesity has been associated with increases in health complications such as cardiovascular diseases, hypertension, dyslipidemia, stroke, gallbladder disease, osteoarthritis, sleep apnea, respiratory problems, certain cancers and Type 2 diabetes. Obesity has a great impact on health care spending. In 2008, obesity was associated with a total cost of $147 billion. Medical costs for people who are obese were $1,429 higher than for those with normal weight (CDC, 2012).

Up to 80% of individuals treated with antipsychotics have been found to suffer from medication-induced weight gain and 40% to 60% of persons with schizophrenia are obese as compared to 20% prevalence in the general United States adult population (Green, Patel, Goissman, Allison, & Blackburn, 2000). Mental illness has been found to predispose individuals to becoming overweight or obese. There is evidence that, compared with the general population, people with early-stage and/or without medication or with previously untreated schizophrenia and bipolar disorder are at increased risk of having increased body mass index (BMI) $\geq 25$ kg/m$^2$ corresponding to the medical
diagnosis of overweight, or BMI ≥ 30 kg/m² corresponding to obesity and central obesity (De Hert et al., 2011; Maina, Salvi, Vitalucci, D'Ambrosio, & Bogetto, 2008). Further evidence indicates that there is a 2.8 to 3.5 fold increase in the risk of obesity in patients with schizophrenia and 1.2 to 1.5 fold increase in patients with major depression or bipolar disorder. Overall, weight gain is a well-established adverse effect of acute and maintenance antipsychotic treatment in patients with schizophrenia, and affects between 15% and 72% of patients (De Hert et al., 2011; Maina et al., 2008). Evidence further suggests that similar effects occur in patients with bipolar disorder on antipsychotic medications (De Hert, et al., 2011).

According to Stahl (2008), some of the atypical antipsychotic agents are associated with significant cardiometabolic risks. These risks include weight gain, obesity, dyslipidemia, diabetes, accelerated cardiovascular disease, and premature death. The “metabolic highway” (Stahl, 2008, p. 388) begins with increased appetite and weight gain which progresses to obesity, insulin resistance, and dyslipidemia with increase in fasting triglyceride level. Ultimately, hyperinsulinemia advances to pancreatic beta cell failure, prediabetes and diabetes. Once diabetes has been established, the risk for cardiovascular events and premature death is further increased.

Many patients taking psychotropic medications gain enough weight to adversely affect their health. Losing this weight, even after the psychotropic drug is discontinued, can be difficult (Sachs & Guille, 1999). Obesity and medication related weight gain have also been observed to play a role in treatment outcomes by decreasing treatment adherence (Loh, Meyer, & Leckband, 2006; Weiden, Mackell, & McDonnell, 2004).
Patients may stop taking medication prematurely due to concern of weight gain. In patients with schizophrenia, data indicate that obese patients are 2.5 times more likely to miss taking their antipsychotic than those with BMI in the normal range of less than 25kg/m² (Weiden et al., 2004). Weight gain and obesity also have social consequences to the individuals who are affected. It has been observed that excess weight and obesity leads to social withdrawal as a result of stigmatization and discrimination (Kurzthaler & Fleischhacker, 2001).

There have been different theories regarding the mechanism underlying the association observed between antipsychotic medications and weight gain. To date, mechanisms underlying antipsychotic cardiometabolic adverse effects are incompletely understood.

Correll, Lencz and Malhotra (2011) discuss that recent clinical, molecular and genetic data suggest that: (a) antipsychotic-naive samples provide the greatest power for mechanistic study; (b) weight and metabolic effects can be discordant with overlapping and distinct mechanism; (c) antipsychotics affect satiety and energy homeostasis signaling; (d) the specific peptide mediating these effects is unknown but overlaps with those involved in idiopathic obesity; and (e) single nucleotide polymorphisms in genes encoding known neurotransmitter receptors and metabolic proteins are promising pharmacogenomic targets for countering adverse effects. (pp.97)
Weight Gain Independent of Antipsychotic Medications

Other than antipsychotic medications, it has been observed that multiple factors contribute to the risk for obesity among patients with mental illness. Behavioral and environmental risk factors contribute to overweight and obesity in patients with mental illness. Lifestyle factors including poor dietary habits, lack of exercise or limited activity and inactivity due to negative symptoms have been hypothesized as contributors of weight gain in patients with schizophrenia (Basu et al., 2004). Many patients with schizophrenia also live in group homes which may promote sedentary living and rarely provide diets to manage weight (Cjafetz, White, Collins-Bride, & Nickens, 2005). Physiological factors also play a role in weight gain.

Ryan and Thakore (2002) indicate that patients with schizophrenia have an increased propensity for storing excess fat as intraabdominal (visceral) adiposity. Low baseline body mass index (BBMI) has also consistently been demonstrated to be a demographic risk factor with nearly every SGA (Gebhardt et al., 2009). Low BBMI patients consistently gain weight at an increased rate compared with their heavier counterparts. It has been suggested that low BBMI patients may have a higher resting metabolic rate and thus weight gain may be explained by a proportional decrease in metabolic rate in response to drug therapy. However, low BBMI may be associated with the fact that many of these individuals have lost considerable weight due to their untreated illness. Kurzthaler and Fleischhacker (2004) indicate that positive symptoms may lead to weight loss when patients stop eating to “cleanse” themselves or because of command hallucinations. Weight increase in such patients may reflect symptom
reduction and improvement. Additionally other significant predictors of risk of weight gain have been determined to be a younger age at treatment initiation, female sex, first exposure to antipsychotics, family history of high BMI, and non-smoking status (Gebhardt et al., 2009).

**Interventions Used for Weight Management**

Modest weight loss has been associated with health benefits, including improved cardiovascular health among individuals who are overweight or obese (National Institutes of Health [NIH], 1998). It has been recommended that weight prevention programs should be initiated when patients begin antipsychotic treatment in an effort to prevent or decrease weight gain (Littrell, Hilligoss, Kirshner, Petty, & Johnson, 2003). Dixon et al. (2009) also recommend that individuals with schizophrenia who are overweight (BMI=25.0 -29.9) or obese (BMI ≥30.0) should be offered a psychosocial weight loss intervention to promote weight loss. The key elements of psychosocial interventions proposed for weight loss include psychoeducation focused on nutritional counseling, caloric expenditure, and portion control; behavioral self-management including motivational enhancement, goal setting, regular weigh-ins, self-monitoring of daily food and activity levels; and dietary and physical activity modification.

Clinical guidelines also recommend that adults should avoid sedentary lifestyles by being active (U.S. Department of Health and Human Services [USDHHS], 2008). Additionally, it is indicated that some physical activity is better than none and adults who participate in any amount of physical activity gain some health benefits. Regular activity
has also been recommended for adults with chronic conditions due to the resulting health benefits.

There is an increasing interest to develop treatment alternatives to control weight gain in patients on antipsychotic medications. Maayan and Correll (2010) suggest three strategies that can be utilized to manage antipsychotic induced weight gain that include switching to a less metabolically adverse antipsychotic, adjunctive behavioral treatments, and adjunctive pharmacological treatments. However each of these strategies has been found to be only modestly effective. Furthermore weight was not decreased to pretreatment level particularly in antipsychotic-naive patients even when interventions were co-initiated with antipsychotics. Among different behavioral interventions, group and individual treatment, dietary counseling and cognitive-behavioral therapy seem to be similarly effective. Among 15 different pharmacological strategies the most evidence available was for metformin; however there was lack of availability of head-to-head trials comparing individual pharmacologic interventions. Another study by Faulkner, Cohn, and Remington (2007) reviewed interventions to reduce weight gain in schizophrenia and concluded that there was insufficient evidence to support the general use of adjunctive pharmacological interventions to reduce weight gain in schizophrenia.

Literature has indicated lack of support for the use of pharmacological interventions. Psychoeducational interventions are important for the target patient population, and may decrease cardiometabolic risk factors. More importantly the psychoeducational intervention may impart knowledge and skills that may promote healthy lifestyles in the target population.
Significance of the Project

There is a growing practice problem facing clinicians on how to prevent weight gain in patients on antipsychotic medication. One recommended approach to treating antipsychotic-induced weight gain is switching the antipsychotic (Das, Mendez, Jagasia, & Labbate, 2012). Das et al. found that there are a few studies evaluating if the switch works, and there is almost no evidence about the long-term weight loss benefits of switching.

The psychopharmacology of weight loss with drugs that have been studied to promote weight loss in patients on antipsychotic medications is poorly understood (Das et al., 2012). Additionally, there is little evidence that pharmacologic treatment is superior to behavioral treatment. Despite the lack of research on combining behavioral and pharmacologic treatment, Das et al. doubt the effectiveness of pharmacological treatments without behavior change.

This project is significant as it is clear that interventions targeting behavioral modification are the cornerstone of weight loss treatment in clients on antipsychotic medications (Das et al., 2012). Weight gain has an appalling impact on those who experience it and on the society at large. Implementation of interventions that focus on prevention of weight gain or obesity is crucial. It has been reported that patients with severe mental illness have limited access to general somatic health care and receive less somatic health care than patients without mental illness (Fleischhaker et al., 2008). Furthermore even when somatic health care is provided it has been reported to be of a lower quality than that for patients without serious mental disorders. The disparities in
health service delivery and treatment provision can therefore hamper the recognition of overweight and obesity in patients with mental illness.

Many clinicians will be interested in whether non-pharmacological interventions like the implementation of a psychoeducation intervention for patients on antipsychotic medication will prevent weight gain or lead to weight loss. This project intervention which focuses on a non-pharmacological psychoeducation intervention for patients on antipsychotic medications with the aim of preventing weight gain or obesity is an important step. The implementation is also an attempt to develop a best practice approach that can improve patient outcomes in an already vulnerable population. Advanced Practice Nurses (APNs) have a key role to play in improving outcomes for vulnerable populations. The overall implication for APNs is therefore to implement interventions that will target weight gain and obesity in patients managed by antipsychotic medications. Given the significant threat of antipsychotic medication related weight gain to the course of mental illness, quality of life, health complications, health outcomes and healthcare spending, it is imperative to examine whether a nurse practitioner-led non-pharmacological intervention will facilitate prevention of weight gain.

**Target Population**

The proposed project was conducted at a Community Mental Health Clinic in a mid-western city in the United States. The target population included patients taking at least one antipsychotic medication. The populations served at the project site are community case management clients who have serious mental illness or co-occurring disorder (mental health, medical health, or substance use).
Purpose of the Project

The prevalence of overweight and obesity in the mental health population is concerning. Overweight and obesity is the precursor of increased cardiometabolic risks. Unhealthy lifestyle and environmental factors further escalate the problem. It is therefore important to investigate whether the implementation of a psychoeducation intervention will be beneficial to an already vulnerable population.

The purpose of the project was therefore to (a) study the effect of an individualized psychoeducation intervention on nutrition, physical activity, weight, BMI, blood pressure, waist circumference, waist/hip ratio in adult patients (aged 18 and above) with severe mental illness who are on antipsychotic medications; and (b) evaluate the effect of an individualized psychoeducation intervention on health promoting lifestyles of adult patients (aged 18 and above) with severe mental illness who are on antipsychotic medications.

Translational Project Question

The guiding questions in the project were (a) What effect does an individualized psychoeducational intervention have on nutrition, physical activity, weight, BMI, blood pressure, waist circumference, waist/hip ratio in adult patients (aged 18 and above) with severe mental illness who are on antipsychotic medications? (b) What effect does an individualized psychoeducational intervention have on health promoting lifestyles of adult patients (aged 18 and above) with severe mental illness who are on antipsychotic medications?
CHAPTER 2
REVIEW OF LITERATURE

The purpose of this project was to implement a psychoeducational intervention that would increase awareness of nutrition and physical activity for adults (aged 18 and above) with severe mental illness who are taking antipsychotic medications. The second purpose of the intervention was to determine if the intervention had any effect on weight, BMI, blood pressure, pulse, waist circumference, waist/hip ratio and health promoting lifestyles among this group of adults.

The purpose of this chapter is to review literature relative to non-pharmacological interventions that are used to prevent weight gain in patients on antipsychotic medications. Modes of delivery of education in patients with mental illness are also discussed. To explore current literature focusing on interventions for prevention of weight gain in patients on antipsychotic medications, the following databases were reviewed: CINAHL; Cochrane Review; PubMed; Proquest: and PsycINFO. Keywords or phrases for this review included weight gain; weight loss; weight prevention; psychoeducation; antipsychotics; second generation antipsychotics; atypical antipsychotics; non-pharmacologic; behavioral therapies; schizophrenia; and metabolic syndrome. Keywords used to review modes of education delivery were education; mental health; antipsychotics; and systematic review. Additionally, the reference lists of all retrieved literature were reviewed for potential inclusion.

The risk of metabolic syndrome associated with various atypical antipsychotic medications has been described across numerous studies with higher effects seen for
certain antipsychotic medications on weight gain, waist circumference, fasting triglyceride level, and glucose levels (Riordan, Antonini, & Murphy, 2011). Studies have shown that the prevalence of metabolic syndrome and cardiometabolic risk factors, such as overweight, hypertension, dyslipidemia and glucose abnormalities are substantial in patients with mental illness in the United States. The Clinical Antipsychotic Trial of Intervention Effectiveness (CATIE) clinical trials, which included 1361 patients receiving antipsychotic treatment, documented a 35.8 % prevalence of metabolic syndrome (McEvoy et al., 2005).

Another study by Correll et al. (2010) involved a one-day national cardiometabolic screening program for patients in a variety of public mental health facilities, group practices, and community behavioral health clinics. The study was carried out between 2005 and 2008 and included a total of 10,084 patients at 219 sites. The study found that for the overall sample, the mean waist circumference was 41.1 inches for men and 40.4 inches for women; 27% were overweight (body mass index [BMI] 25.0-29.9 kg/m2), 52% were obese (BMI ≥ 30.0kg/m2), 51% had elevated total cholesterol ( ≥ 200mg/dl), 59% had a low level of high-density lipoprotein cholesterol (< 40mg/dl for men or < 50mg/dl for women), 45% had elevated triglycerides ( ≥ 150 mg/dl), and 33% had elevated fasting glucose ( ≥ 100mg/dl).

To clinicians, an increasingly difficult practice problem is how to prevent weight gain in patients on antipsychotic medications in order to improve patient outcomes. Riordan et al. (2011) recommend that programs aimed at improving clinical measures associated with metabolic syndrome may decrease important risk factors, improve
patients’ quality of life and significantly reduce healthcare costs. One suggested approach to treating antipsychotic-induced weight gain is switching the antipsychotic (Das et al., 2012). According to Das et al., additional long-term studies are required to influence the clinical practice since the psychopharmacology of weight loss with some of these medications is poorly understood. Furthermore, Das et al. found little evidence that pharmacologic treatment is superior to behavioral treatment. Of medications studied, only sibutramine and topiramate showed appreciable modest weight loss of approximately 2 to 3 kg in short-term studies compared to placebo. Despite the lack of research combining behavioral and pharmacologic treatment, Das et al. doubt the effectiveness of pharmacologic treatments without behavior change. It is therefore likely that interventions targeting behavioral modification are the cornerstone of weight loss treatment in clients on antipsychotic medications (Das et al., 2012). According to Das et al., behavioral treatments have been found to lead to modest weight loss, compared to controls, ranging from 0.5 kg to 4.0 kg.

Many clinicians will be interested in whether non-pharmacological interventions like the implementation of a psychoeducation intervention for patients on antipsychotic medication will prevent weight gain or lead to weight loss. According to Dixon et al. (2009) in the Schizophrenia Patient Outcomes Research Team (PORT), psychosocial treatment recommendations and summary statements recommend that individuals with schizophrenia who are overweight (BMI=25.0-29.9) or obese (BMI≥30.0) should be offered a psychosocial weight loss intervention that is at least three months in duration to promote weight loss. The key elements of psychosocial interventions for weight loss
include psychoeducation focused on nutritional counseling, caloric expenditure, and portion control; behavioral self-management including motivational enhancement; goal setting; regular weigh-ins, self-monitoring of daily food and activity levels; and dietary and physical activity modification.

Dixon et al. (2009) mention that while the evidence for intervention for weight loss is strong enough to warrant a recommendation, the current state of the literature exploring psychosocial interventions for the prevention of weight gain among individuals with schizophrenia is not substantial enough to warrant a formal recommendation by the PORT. The absence of randomized controlled studies has been a key setback in developing evidence-based interventions that can manage weight loss among this population. To date only a few randomized control trials (RCTs) targeting the prevention of weight gain among individuals with schizophrenia who had recently begun taking antipsychotic medications have been published.

Due to the lack of consensus on management of antipsychotic medication induced weight gain, an attempt has been made to review all relevant literature pertaining to current strategies. To adequately develop a comprehensive weight prevention intervention for clients on antipsychotic medications, investigating existing programs and reviewing elements that contributed to their success is necessary. The goal of the review is for the literature to guide and support the design of the intervention that will contribute to the greatest outcome.

Two approaches to non-pharmacological management of weight management have been identified in the literature including psychoeducation and cognitive behavioral
interventions. The existing literature reviewed will be compared by study design, methods, theoretical framework, study setting, participants, inclusion and exclusion criteria, variables, scales and statistical tests, findings, limitations of the study, and implications for clinical practice.

**Meta-Analyses**

Five key meta-analyses concerned with weight management in patients on antipsychotic medications have been reviewed. Das, Mendez, Jagasia, and Labbate (2012) performed a comprehensive literature review of all controlled clinical trials for pharmacological and/or behavioral management of SGA-induced weight gain in schizophrenia patients by searching PubMed and Google Scholar. They used combinations of search terms schizophrenia, weight gain, weight loss, antipsychotics, behavioral therapies, non-pharmacologic, second-generation antipsychotic, and switching with limits of clinical trials. A total of 63 studies were reviewed and analyzed. The studies were combined using meta-analytic techniques to assess the impact on weight change of various pharmacologic and behavioral treatments. Studies were classified in the same group if they addressed a similar question (i.e., weight loss caused by a specific pharmacologic intervention). The analysis showed that sample sizes were generally small. Clinical trials were six weeks to one year, and weight loss was modest with any treatment. Several adjunctive pharmacologic treatments showed no weight loss; sibutramine, metformin, and topiramate showed some benefit. Amantadine and orlistat were somewhat less effective and had lower rates of tolerability. The analysis also found that among behavioral therapies, nutritional counseling combined with exercise showed
the most benefit. Behavioral therapies showed modest but most consistent benefits compared with controls. The authors concluded that scheduled pharmacologic treatment to prevent weight gain or promote weight loss in schizophrenia patients on SGA therapy was limited based on the review. They also concluded that switching antipsychotic agents has not been established as a long-term solution and additional long-term studies were required to influence clinical practice. This study suggests that non-pharmacologic interventions may be beneficial to clients on antipsychotic medications.

Alvarez-Jimenez, Hetrick, Gonzalez-Blanch, Gleeson, and McGorry (2008) carried out a systematic review and meta-analysis of RCTs. The inclusion criteria were RCTs of a specific non-pharmacological adjunctive intervention aimed at prevention or controlling antipsychotic-induced weight gain, with at least 75% of participants who had been diagnosed with schizophrenia-spectrum disorders using either the Diagnostic and Statistical Manual (DSM) or International Code of Diagnosis (ICD). A total of ten trials with interventions lasting between eight weeks and six months were included in the meta-analysis. The participants were either young adults with recent-onset psychosis or adults with chronic schizophrenia, hospitalized or out-patients, and receiving treatment with first- or second-generation antipsychotic drugs. The primary outcome was considered to be mean change in body weight and BMI by the end of the intervention, while the secondary outcome measure included mean change in both body weight and BMI by follow-up. Additional secondary outcome measures comprised mean change of ratings of quality of life, medication adherence and relapse rates. A total of 482 patients were
included in the RCTs that compared non-pharmacological interventions with treatment as usual.

Alvarez-Jimenez et al. (2008) found that there was a statistically significant reduction in mean body weight for participants in the non-pharmacological intervention groups compared with those on treatment as usual (weight mean difference, WMD=-2.56 kg, 95% CI -3.20 to -1.92kg, p< 0.0001). The pooling treatment effects of mean BMI change across all interventions yielded similar significant results in favor of the non-pharmacological interventions (WMD=-0.91kg/m², 95% CI -1.13 to -0.68kg/m², p<0.0001). The study also observed that pooling treatment effects change in body weight and in BMI demonstrated statistically significant advantages of non-pharmacological interventions at follow-up. The study concluded that adjunctive non-pharmacological interventions, whether individual or group interventions, or cognitive behavioral therapy with nutritional counseling, were effective in reducing or attenuating antipsychotic-induced weight gain compared with treatment as usual. Additionally treatment effects of non-pharmacological interventions were maintained to follow-up. Similarly this meta-analytic review consistently found that non-pharmacological interventions led to significant weight loss in patients on antipsychotic medications. These findings are notable and support the potential of a non-pharmacological psychoeducation intervention to facilitate weight loss in participants aged 18 years and older who are on antipsychotic medications.

Faulkner, Cohn, and Remington (2007) reviewed studies with the objective of determining the effects of both pharmacological (excluding medication switching) and
non-pharmacological strategies for reducing or preventing weight gain in individuals with schizophrenia. Key databases and the Cochrane Schizophrenia Group’s trials register and reference sections within relevant articles were searched. The authors also hand searched key journals and contacted first authors of each relevant study and other experts to collect further information. The selection criteria included RCTs that compared any pharmacological or non-pharmacological intervention for weight gain (e.g., diet and exercise counseling including those with elements of cognitive and/or behavioral modification) with standard care or other treatments for individuals with schizophrenia or schizophrenia-like illnesses. Weighted mean differences of the change in weight from baseline were calculated. Where heterogeneity existed (determined by a chi-square test), a random-effects model was used. The primary outcome measure was weight loss.

Twenty-three RCTs met the inclusion criteria for the review (Faulkner et al., 2007). Five trials assessed a cognitive/behavioral intervention while eighteen trials used a pharmacological adjunct. Two cognitive/behavioral interventions showed significant mean weight change at the end of the treatment (2 RCTs, n=104, WMD=-3.38kg, CI -4.81 to -1.96). Three cognitive/behavioral trials showed significant treatment effect at end of treatment (3 RCTs, n=129, WMD=-1.69 kg, CI -2.77 to -0.61). Pharmacological adjunct showed an overall treatment effect (9 RCTs, n=273, WMD=-2.97 KG, CI -4.48 to -1.46). The study concluded that modest short-term weight loss can be achieved with selective pharmacological and non-pharmacological interventions. According to the authors, interpretation of the study was limited by the small number of studies, small sample sizes, short study durations, variability of the interventions themselves, and
intensity and duration of study. The sample sizes in most studies ranged between 14 and 171. The duration of the trials ranged between six weeks and twenty-four weeks. The average duration was found to be approximately twelve weeks. All the five cognitive/behavioral studies were not double-blind due to the inherent difficulty involved in disguising psychosocial interventions. Out of the eighteen pharmacological interventions, sixteen were double blind and two were open.

A systematic review was conducted on the effectiveness of interventions designed to control weight gain in schizophrenia (Faulkner, Soundy, & Lloyd, 2003). A total of 16 studies met the inclusion criteria. Eight studies which included behavioral (including diet and/or exercise) interventions reported consistent small reductions in or maintenance of weight. The authors concluded that incorporating multiple components of diet, exercise and/or behavioral counseling were all successful in limiting weight gain. Additionally they concluded that both dietary and exercise counseling set within a behavioral modification program is necessary for sustained weight control. The authors mention that weak study designs and small sample sizes observed in many studies were a limitation.

Faulkner and Cohn (2006) undertook a selective review of interventions for weight gain and metabolic disturbance in the general population and in individuals treated with antipsychotic medications focusing on RCTs in schizophrenia. The review analyzed both pharmacological and non-pharmacological interventions. Four RCTs of non-pharmacological interventions were identified. They had a total of 208 participants (98 men and 110 women) with an average age of 36.14 years and an average weight of
87.99 kg at the start of the study (as well as average BMI of 29.09 kg/m², reported in three of the studies). The participants were primarily outpatients taking olanzapine in three studies. The length of the interventions ranged from 14 weeks to three months. Three studies involved cognitive-behavioral group interventions incorporating education and discussion regarding diet and physical activity, and one study used one-on-one dietary counseling. Faulkner and Cohn mention that the intervention sessions included individual and group work, written exercises, tests, and discussions to develop and rehearse self-monitoring skills (for example, modifying urges to overeat and changing snacking habits) and set regularly reviewed healthy-eating lifestyle goals. Three studies involving cognitive-behavioral interventions confirmed that modest weight-gain prevention or weight loss is possible in the short term, although there were no statistically significant findings in two studies. The authors mention that the limitation of the review was the small number of rigorous RCTs of short-term duration and the small sample sizes.

**Literature Review on Psychoeducation Interventions**

The aim of psychoeducation (or patient education/teaching) in patients with mental illness is to increase knowledge and understanding of their illness and treatment (Xia, Merinder, & Belgamwar, 2011). Psychoeducational interventions involve the interaction between the information provider and mentally ill person. Psychoeducation interventions are brief and inexpensive making them attractive to managers and policy makers.
A study was carried out over a six month period with an aim of assessing the effect of an education intervention on antipsychotic-induced weight gain among patients with schizophrenia who were being treated with olanzapine (Littrell, Hilligoss, Kirshner, Petty, & Johnson, 2003). The study was a quasi-experimental design with 70 patients with a DSM-IV diagnosis of schizophrenia or schizoaffective disorder. Patients were randomly assigned to an intervention group or a standard care group. For over four months, the intervention group participated in weekly psychoeducation classes that focused on nutrition, exercise, and living a healthy lifestyle. The participants were followed for an additional two months to assess weight change.

The study found a statistically significant difference in weight change between the two groups at post-treatment and at endpoint (Littrell et al., 2003). At the endpoint of the study, the mean weight change of the intervention group was -0.06 pounds, while the mean weight change in the standard care group was an additional 9.57 pounds. The study concluded that a structured educational intervention might have a positive effect on antipsychotic-induced weight gain among patients with schizophrenia. Study limitations included unclear effects of dosing of olanzapine since it was prescribed in a flexible-dose manner and concomitant medication use in some patients. The relatively short study duration and lack of measuring subjects’ extraneous variables such as medication history and familial trends for subjects in the two groups was also recognized as a limitation. It is encouraging that their study showed that a simple group psychoeducation intervention attained a clinically meaningful outcome for participants.
Wu et al. (2008) carried out a 12 week study to compare the effectiveness of several interventions in reducing the weight gain associated with the use of antipsychotic agents in patients with schizophrenia. The study included patients who were 18-45 years of age. Patients were randomized to receive metformin alone (750 mg per day), placebo alone, lifestyle intervention plus metformin, or lifestyle intervention and placebo. Lifestyle interventions consisted of a psychoeducation approach with an emphasis on the role of eating and exercise on weight management, including a dietary intervention recommended by the American Heart Association, and exercise programs initiated at the study site and continued at home. Out of the 128 eligible patients, 118 completed the study: 30 patients in the lifestyle intervention plus metformin group, 30 patients in the metformin alone group, 29 patients in the lifestyle intervention plus placebo group, and 29 patients in the placebo alone group.

Wu et al. (2008) found that lifestyle-plus metformin group had a mean decrease in BMI of 1.8 (95% CI, 1.3-2.3). The metformin-alone group had a mean decrease of 1.2 (95% CI, 0.9 to -1.5) in BMI. Lifestyle group had a mean decrease of 0.5(95%CI, -0.3 to -0.8). The placebo group had a mean increase in weight gain of 1.2 (95% CI, 0.9 -1.5). Analysis of variance (ANOVA) was used to compare all continuous variables. Statistical comparisons among the interventions showed the metformin plus lifestyle group had results that were statistically significant compared to all other interventions. In addition, all interventions were superior to placebo. The study concluded that all interventions were better than placebo alone for producing weight loss in patients with schizophrenia who had gained weight from atypical antipsychotic medications. The limitation when
interpreting this study is that some interventions were multicomponent making it difficult to define which strategies worked best.

Vreeland, Minsky, Gara, and Toto (2010) carried out a study to examine the effectiveness of a manualized, psychoeducational wellness toolkit called the Solutions for Wellness (SFW). The aim of the study was to examine whether mental health consumers who volunteered to participate in an intensive group intervention with the SFW program increased knowledge about wellness and changed their attitude/intentions to pursue healthier lifestyle choices. The primary outcome measure was change in knowledge and attitudes/intentions. Secondary outcomes were change in BMI, weight, systolic and diastolic blood pressure, pulse, waist circumference, hope and clinician rating of clinical status. Thirty-four participants with mental illness participated in an intensive 10-week manualized group wellness program while the control group contained 31 participants who did not receive the treatment.

Vreeland et al. (2010) found statistically significant pre-post improvement in knowledge (p= 0.001), attitudes (p= 0.007), BMI (p= 0.0066), weight (p= 0.0079) and systolic blood pressure (p= 0.0007). The study also found that the intervention group evidenced statistically significant improvements in knowledge about and attitudes/intentions toward making healthier lifestyle choices, weight, and BMI in comparison to the group that did not receive any intervention. The study concluded that an educational intervention may increase mental health consumers’ knowledge about wellness and bring about changes in attitudes/intentions to pursue healthier lifestyle choices. The relatively short study duration and lack of randomization of participants
were recognized as limitations of this study. What is encouraging is that even a 10 week psychoeducation intervention attained a clinically significant outcome for participants.

Menza et al. (2004) carried out a prospective study with the purpose of testing the feasibility and efficacy of a multimodal weight control program for overweight and obese mentally ill adults who had gained weight while taking atypical antipsychotic medications. The participants were 31 subjects with schizophrenia or schizoaffective disorder (DSM-IV), taking an atypical antipsychotic, who participated in a 52-week Healthy Living program. The program incorporated nutrition counseling, exercise, and a behavioral intervention designed to help adults with schizophrenia implement healthy lifestyle changes. Strategies used in the program included behavioral strategies, brainstorming, positive feedback and special teaching approaches. A group receiving usual care contained 20 subjects. The primary outcomes which were measured in the intervention group included BMI and weight while secondary outcomes included hemoglobin A1c level, systolic and diastolic blood pressure, and cholesterol level compared from baseline to endpoint (Menza et al., 2004). Twenty of the 31 subjects completed the program. The study found statistically significant pre-post improvements in weight (p<0.02), BMI (p< 0.02), hemoglobin A1c (p< 0.01), diastolic (p< 0.001) and systolic (p< 0.05) blood pressure, exercise level (p< 0.003), nutrition knowledge (p< 0.0001), stage of change (exercise p< 0.0001), and weight (p< 0.008) in the intervention group. Weight and BMI decreased significantly (p= 0.01) in the intervention group compared with the “usual care” group, who gained weight.
The study concluded that individuals with schizophrenia and schizoaffective disorders benefited from a weight control program that focused on nutrition, exercise, and motivation. Additionally the program resulted in clinically significant reductions in weight, BMI, and other risk factors for long-term poor health, including hemoglobin A1c. Lack of random assignment and a small sample size were identified as study limitations. A key inference from this study is that a non-pharmacological intervention can lead to weight loss and also improve other risk factors for poor health compared to no intervention in clients with mental illness.

Brown and Chan (2006) carried out a randomized controlled trial using the Lilly “Meaningful Day” manual which delivers health promotion interventions and focuses on weight reduction. The Meaningful Day manual uses techniques such as motivational interviewing, health education, and food and activity diaries among the interventions. It also facilitates access to local community facilities. A total of 28 patients were randomized to treatment (n= 15) or control (n= 13) group. Only 7 (47%) subjects and 10 (77%) controls completed the study. The mean change in weight between the subjects (-0.40 kg weight loss) and controls (+ 1.11kg weight gain) was statistically significant, p= 0.01. The mean change in BMI between the subject (- 0.02 kg/m²) and the controls (+ 0.41 kg /m²) was also statistically significant, p= 0.02. The study concluded that the intervention produced significant health gains to participants. However the findings of this study should be treated with caution due to the high attrition rate.

Another study carried out an electronic search of published articles pertaining to the use of behavioral interventions in individuals with schizophrenia using PsyINFO and
Medline (Loh, Meyer, & Leckband, 2006). A total of 23 studies with a total sample of 701 participants was identified. The types of behavioral interventions consisted of behavioral modification techniques, caloric restriction, and psychoeducation. Weight loss was reported in 19 studies, while the remaining studies showed either maintenance of baseline weight or minimum weight gain. The authors concluded that much of the literature was methodologically unsound and only applicable to inpatient settings. Furthermore high drop-out rates and the absence of extended post-treatment follow-up still limit the conclusions regarding general efficacy of behavioral treatment of obesity in patients with schizophrenia.

**Literature Review on Cognitive Behavioral Interventions**

Three articles involving the use of cognitive behavioral interventions were identified. Zhang et al. (2012) carried out a study to compare the effectiveness of a cognitive-behavioral weight loss intervention in obese subjects with psychiatric disorders and those without. This study was a 12 month naturalistic study of weekly group or individual cognitive-behavioral management in 222 obese patients with psychotic spectrum disorders (n=47), other psychiatric disorders (n= 49), and no psychiatric disorders (n=126). Participants were either self-referred or referred by other health care professionals. The mean age of the participants was 49.2 ± 14.1 years old and the mean BMI was 43.7± 9.6. The treatment consisted of cognitive behavior therapy from Northwestern University Medical School’s People at Risk Weight Control Program. Weekly treatment was delivered by a team consisting of psychotherapist, a nutritionist, and an exercise physiologist in individual sessions lasting 45 to 50 minutes or group
sessions lasting 60 to 75 minutes. The assignment of group or individual treatment was based on clinical judgment or patient’s preference. The treatment provided enhanced self-monitoring of food intake and exercise habits, behavioral contracting, cognitive restructuring, and stimulus control.

The primary outcome measure in the study by Zhang et al. (2012) was the absolute and relative change in weight and BMI. Secondary outcomes included percentage of patient with 5% or more weight loss at the end of treatment. The study found that at the 12 month follow up, 62 patients (27.9%) remained in treatment. The entire sample lost 3.54 ± 9.02 pounds from baseline (i.e. 1.34%± 3.39% loss ) of baseline weight at the 3month follow up, 6.27 ± 14.62 pounds (2.33% ± 5.22%) at 6 months, 7.98 ± 17.21 pounds (2.96% ± 6.23%) at 9 months , and 8.47 ± 18.75 pounds ( 3.15% ± 6.70%) pounds at 12 months (p< 0.001). Patients with a psychotic spectrum disorder had greater percent baseline weight loss at 12 months (5.1% ± 9.3%) than patients with other psychiatric disorders and with no psychiatric disorder (2.7% ± 5.5% and 2.4 ±6.3%). Patients with psychotic spectrum disorder also had a greater percent BMI loss at 9 months (2.1 ± 3.5 kg/m$^2$) and 12 months (2.3 ± 4.1 kg/m$^2$) than those with no psychiatric disorder (1.1 ± 2.3 and 1.2 ± 2.4 kg/m$^2$) respectively. Weight loss of 5% or more occurred in 42.6% of patients with psychotic spectrum disorders versus 18.4% and 23.0% for those with other psychiatric disorders or with no psychiatric disorder (p< 0.001) respectively. The study found that attrition was higher for those with no psychiatric disorder (p = 0.001) or with other psychiatric disorders (p=0.036), for those who
participated in a lower proportion of group sessions (p=0.002), for those with more depression (p=0.028), and those with lower baseline BMI (p=0.030).

Zhang et al. (2012) concluded that patients with psychotic spectrum disorders had greater weight loss than other obese patients. They also concluded that nonadherence and depression should be targeted to enhance weight loss success. This study is significant as it is the first study to compare weight loss outcomes of a non-pharmacological treatment programs between patients with psychotic disorders and individuals with nonpsychotic psychiatric conditions or no psychiatric illness. The authors identified study limitations as lack of randomization, the lack of blinding, and the possibility that patients with psychotic spectrum disorders received more clinical attention that resulted in them staying in the program longer and in turn playing a role in their greater weight loss.

Weber and Wyne (2006) conducted a 16-week pilot study using a randomized-control group design to examine the effectiveness of a cognitive behavioral group intervention based on the Diabetes Prevention Project (DPP) lifestyle intervention for individuals who were taking atypical antipsychotics. The study included people with schizophrenia or schizoaffective disorder who were being treated in a large urban public mental health clinic system. The content of the program was based on cognitive behavioral strategies to promote risk reduction that were demonstrated to be successful in the DPP. A total of 17 participants were randomized to either the 16 week cognitive behavioral group intervention (n= 8) or treatment as usual group (n =9). The cognitive behavioral group participants lost an average of 5.4 lb or 2.9% of body weight, and those in the control group lost 1.3 lb or 0.6% body weight (Weber & Wyne, 2006). The range
of weight loss for the treatment group was from 1 to 20 lbs. The researchers concluded that the pilot study demonstrated that weight loss is possible with cognitive behavioral interventions in a population with psychotic disorders. The major limitation of the pilot study was the small sample size that made it impossible to show significance.

Kwon et al. (2006) carried out a study with the objective of assessing the efficacy of a weight management program designed for outpatients taking olanzapine for schizophrenia or schizoaffective disorder. The main components of the study were diet and exercise management, which were based on cognitive and behavioral therapy. A total of 48 patients were enrolled in a 12-week, randomized, multicenter weight management study. A total of 33 patients were randomly assigned to the intervention group which received olanzapine within a weight management program. Fifteen patients were allocated to a control group in which they were given olanzapine treatment as usual. Weight, body mass index (BMI), and measurements of safety and quality of life were evaluated. A total of 36 patients (75%) in the intervention and the control group completed the study. The study found a significant difference in weight (-3.94 ± 3.63 vs. -1.48 ± 1.88 kg, p = 0.006) and BMI (-1.50 ± 1.34 vs. -0.59 ± 0.73, p = 0.007) change from baseline to endpoint between the intervention and control groups respectively. The study concluded that a cognitive behavioral weight management program was effective in terms of weight reduction in patients with schizophrenia or schizoaffective disorder taking olanzapine. The authors mention that the limitation of the study included a small sample size and short study duration. Additionally, disproportionate dropout rate is a limitation in the study; of the 36 patients who completed the study, 22 were in the
intervention group, while 14 were in the control group. The strength of this study includes the use of a comparison group and randomization of the participants.

**Modes of Delivery of Educational Interventions**

It is imperative that the design and content of educational program take into account the strengths and limitations of the learners. Patients with mental illness may have deficits in attention, memory, motor skills and social functioning. It is more challenging to educate recipients of mental healthcare due to the cognitive impairments associated with some psychiatric disorders, and due to the growing need for providing greater information about the potential risks of some mental health treatments (Jeste, Dunn, Folsom, & Zisook, 2008). Psychoeducational approaches have been developed to increase patients’ knowledge of, and insight into, their illness and its treatment (Xia, Merinder, & Belgamwar, 2011). It is expected that this increased knowledge and insight will enable clients to cope in a more effective way with their illness, thereby improving their prognosis.

Xia et al. (2011) searched the Cochrane Schizophrenia Group Trials Register. Their objective was to assess the effects of psychoeducational interventions compared with standard methods of knowledge provision. The selection criteria included all relevant RCTs focusing on psychoeducation and /or related serious mental illness involving individuals or groups. Quasi-randomized trials were excluded. A total of 5,142 participants from 44 trials conducted between 1988 and 2009 were included. The median study duration was 12 weeks. The studies found that incidences of non-compliance were lower in the psychoeducation groups in the short term (n=1400, RR
0.52 CI 0.40 to 0.67, NNT 11 CI 9 to 16). This finding held for the medium and long term as well. Relapse appeared to be lower in psychoeducation groups (n =1214, RR 0.70 CI 0.61 to 0.81, NNT 9 CI 7 to 14). Furthermore data suggested that psychoeducation promotes better social and global functioning. Further evidence suggested that participants receiving psychoeducation were more likely to be satisfied with mental health services (n=236, RR 0.24 CI 0.12 to 0.50, NNT 5 CI 5 to 8) and have improved quality of life.

Various patient education interventions have been developed and can be used for individuals with mental disorders. Fernandez, Evans, Griffiths, and Mostacchi (2006) carried out a systematic review with an aim of investigating the efficacy of educational interventions in relation to psychotropic medications for consumers with mental health disorders. The review included RCTs that compared the effects of various educational interventions on knowledge retention, compliance to medication and treatment, incidence of relapse and insight into illness. Subjects were aged 18 years and over with mental disorders. Structured information was defined as receiving information in a planned manner (e.g., videotape, role-play, discussion) and the unstructured information consisted of information that was delivered in an inconsistent manner (e.g., incidental teaching). The study found that patients who were provided with education of either type demonstrated a significant increase in the level of knowledge and compliance compared with those who were not. A structured patient education using both written and verbal methods followed by discussion of the contents proved effective in this patient population. Further evidence also suggested that consumers who were provided with
multiple education session had greater knowledge gains in the short term (up to 1 month); however the effectiveness of multiple sessions in the long term (2 years) is inconclusive in this patient group. The authors therefore concluded that the review provides evidence that multiple education sessions are better than a single education session in improving knowledge in relation to medications and insight into illness. Evidence from the trials also demonstrated that structured educational interventions delivered at frequent intervals are useful as part of the treatment programs for people with mental illness.

Pitkänen et al. (2012) carried out a study with the aim of estimating the effectiveness of patient education methods on quality of life and functional impairment of patients with schizophrenia. A total of 311 patients were randomly assigned to computer-based (information technology [IT]) patient education group (n=100), conventional education with standard leaflets and discussions (n =106), and standard treatment (n=105). In the IT education group, a patient participated in a systematic computer-based education program (Mieli.Net) together with a nurse. The content covered information on illness, treatment, well-being, support and patients’ right. In the conventional education group patients received information in written leaflets. At the beginning of each session the patients received an information leaflet on the topic and discussion focused on that information. The average length of the patient education sessions was 30 minutes. In the standard treatment group patients received patient education according to usual ward procedures. In Finland patient education varies between hospital and units, there are no standardized and uniform guidelines. Depending on individual nurses’ own motivation and inclination, patients may receive individual oral information on their
illness and its treatment in care meetings. The patient in the standard treatment may have also received written material. Nevertheless, educational activities were less systematic and varied between study wards and shifts in the standard treatment group.

Participants in the study were followed up 12 months later. The primary outcome was quality of life while secondary outcome was functional disability. The study found that patients’ global quality of life improved and functional disability decreased significantly in all education groups. Therefore there were no significant differences between groups in these outcomes. The study concluded that there is no evidence to support a particular education method as the best way to improve patient’s quality of life or improve functional ability. The study also concluded that computer-based patient education remains a suitable alternative for some patients. Study limitation includes a high dropout rate of 27.7%. Strength of the study includes randomization of participants to different education groups.

Jeste, Dunn, Folsom, and Zisook (2008) reviewed studies that compared the effects of multimedia (video-or computer based) educational aids with those of routine procedures to inform healthcare consumers about medical evaluations or management. Most of the investigations were conducted for non-psychiatric patients. They found that there are still very few studies concerning patient education programs that have been developed and tested in clinical settings among patients with mental illness. A total of 37 RCTs trials were identified. Nearly two-thirds of the studies (n=23) reported that multimedia educational aids produced better understanding of information compared to routine methods which include pamphlets or leaflets. The authors concluded that
multimedia educational aids hold promise for improving the provision of complex medical information to patients and caregivers.

Recently Välimäki, Hatonen, Lahti, Kuosmanen, and Adams (2012) evaluated the effects of psychoeducational interventions using information and communication technology (ICT) as a means of educating and supporting people with schizophrenia or related psychosis. They searched the Cochrane Schizophrenia Group Trials Register (2008, 2009, and September 2010). They inspected references of identified studies for further trials and contacted these authors for additional information. The selection criteria were all RCTs comparing ICT as a psychoeducational and supportive tool with any other type of psychoeducation and supportive intervention or standard care. They included six trials with a total of 1063 participants. They found no significant differences in the primary outcomes (patient compliance and global state) between psychoeducational interventions using ICT and standard care.

**Summary and Conclusion**

The discussed literature review supports the use of a variety of interventions rather than no intervention in management of weight in patients on antipsychotic medications. What is encouraging is that even studies with small sample sizes attained a meaningful outcome for participants that could improve their health outcomes. The intervention that was implemented in the current project attempted to make a similar effort by evaluating the effectiveness of an eight week psychoeducation intervention on weight, BMI and other risks factors that predispose clients on antipsychotic medications to prediabetes and diabetes. The intervention exposed the participants to an
individualized multimedia psychoeducation with the emphasis on the role of eating and exercises on weight management. The intervention also involved the use of structured patient education using both written and verbal methods followed by discussion during multiple education sessions as supported by the literature.
CHAPTER 3
CONCEPTUAL FRAMEWORK

The purpose of this project was to implement a psychoeducational intervention that would increase awareness of nutrition and physical activity for adults (aged 18 and above) with severe mental illness who are taking antipsychotic medications. The second purpose of the intervention was to determine if the intervention had any effect on weight, BMI, blood pressure, pulse, waist circumference, waist/hip ratio and health promoting lifestyles among this group of adults. This chapter describes the Health Promotion Model (HPM) that was used as a conceptualizing framework to direct the psychoeducation intervention. The Chronic Care Model (CCM) was utilized to understand the complexities of implementing the proposed project in a Community Mental Health Clinic is also discussed.

Health Promotion Model

The HPM first appeared in nursing literature in 1982 and was revised in 1996 based on changing theoretical perspectives and empirical findings (Pender, Murdaugh, & Parsons, 2006). The HPM model is shown in Figure 1. The HPM has its philosophical roots in Reciprocal Interaction World View in which humans are viewed holistically, but parts can be studied in the context of the whole. Human beings therefore interact with their environment and shape it to meet their needs and goals. While implementing the psychoeducational intervention, the facilitator understood that participants can be successfully engaged in actions to achieve goals that are perceived as possible and that can result in valued outcomes. Additionally the facilitator understood that to change
behavior, the participants had to change how they think. The main goal of the psychoeducation intervention was therefore to influence participants to engage in health promoting behaviors. The central focus of the model is on eight beliefs that can be assessed and lead to the implementation of appropriate interventions.

**Figure 1:** Health Promotion Model. Adapted from The Health Promotion Model, Figure 2-4, p.50, Pender, Nola J.; Murdaugh, Carolyn L.; Parsons, Mary Ann. *Health Promotion in Nursing Practice, 5th* edition, © (2006). Reprinted by permission of Pearson Education, Inc, Upper Saddle River NJ. (See Appendix A)
In total there are five key concepts in nursing defined as a basis for the HPM (Pender et al., 2006). They include the person, environment, nursing, health and illness. The person is considered to be a biopsychosocial organism that is partially shaped by the environment but also seeks to create an environment in which natural and acquired human potentials can be fully expressed (Pender et al., 2006). On the other hand the environment is the social, cultural and physical context in which the life course unfolds. The person does not live in isolation but interacts with the environment. Persons on antipsychotic medications are predisposed to overweight and obesity as a result of medication effects and individual characteristics. It has also been found that social and cultural factors further influence their risk to weight gain. While using HPM during the intervention, the facilitator viewed the participants holistically with the belief that they have the ability to transform their environment by using strategies that were acquired from the psychoeducational sessions. The goal was to assist the participants to acquire targeted health behaviors that would lead to an overall improvement of their physical health.

Nursing is defined as collaboration with individuals, families, and communities to create the most favorable conditions for the expression of optimal health and high-level well-being (Pender et al., 2006). During the intervention the facilitator collaborated with the participants and a community in a mid-western city in the United States with the goal of improving the health outcomes of clients on antipsychotic medications.

Health in reference to the individual is the actualization of inherent and acquired human potential through goal-oriented behavior, competent self-care, and satisfying
relationships with others (Pender et al, 2006). The facilitator understood that the psychoeducational intervention was aimed at influencing health promoting behaviors in participants with the goal of improving participants’ physical health outcomes.

Pender et al. (2006) identify illnesses as discrete events throughout the life span. Illness can be either of short (acute) or long (chronic) duration that can hinder or facilitate one’s continuing quest for health. Overweight and obesity are a chronic conditions that has been determined to be a threat to the well-being of persons on antipsychotic medications. While using the HPM as a guiding framework for the intervention, the goal of the facilitator was to prevent weight gain, a major threat that faces clients on antipsychotic medications. The key to improving high rates of overweight and obesity of this population is targeting lifestyle factors. Furthermore engaging in health promotion initiatives was a key role of the facilitator.

**Components of Health Promotion Model**

**Individual Characteristics and Experiences**

Individual characteristics and experiences include prior related behavior and personal factors (Pender et al., 2006). The facilitator acknowledged that these two factors might influence individual’s health-promoting choices. The facilitator used a holistic approach while assisting participants to formulate a plan of action. During the intervention the facilitator obtained an initial assessment of reported daily intake of cups of fruits and vegetables and reported weekly participation in physical activity. Other characteristics of the participants that influenced health behavior that were obtained
during the intervention included gender, ethnicity, age, weight, height, blood pressure, pulse, waist and hip measurements and calculated BMI and waist/hip ratio.

**Behavior-Specific Cognition and Affect**

Behavior-specific cognition and affect that were targeted during the intervention included (a) perceived benefits of action; (b) perceived barriers to action; (c) interpersonal influences; (d) situational influences; and (e) commitment to a plan of action. The facilitator understood that assisting participants to identify behavior-specific cognitions and affect would facilitate self-efficacy in participants and enhance the ability to perform the required action.

Perceived benefits of action are perceptions of the positive or reinforcing consequences of undertaking a health behavior (Pender et al., 2006). During the intervention, each participant was asked to identify at least three benefits of eating fruits and vegetables daily. Additionally, participants also identified at least three benefits of participating in at least 30 minutes of moderate-physical activity on most days of the week.

Perceived barriers to action are the perceptions of the constraints and personal costs of undertaking a health behavior (Pender et al., 2006). During the intervention participants identified barriers that prevented them from eating more fruits, vegetables and engaging in physical activity.

Interpersonal influences include family, peer and providers (Pender et al., 2006). Interpersonal influences have been cited to provide norms, social support, role model perceptions concerning the behaviors, beliefs, or attitudes of relevant others in regard to
engaging in a specific health behavior. The role of the facilitator during the intervention was to provide education and support to participants with the aim of influencing participants to eat more fruits, vegetables and engage in physical activity. The facilitator also provided positive social support with the aim of influencing health promoting behavior change.

Situational influences include options, demand characteristics and aesthetics (Pender et al., 2006). The situational influence serves to support the perceptions of the compatibility of life context or the environment with engaging in a specific health behavior. Situational factors that affected the participants’ ability to attain predetermined goals included access to fruits and vegetables. Situational influences also affected the ability of the participants to meet their physical activity goals. During the intervention the facilitator utilized multiple supported follow-up to reinforce positive behavior and attainment of goals. Participants were also assisted in revising their goals when needed.

Commitment to a plan of action is the intention to carry out a particular health behavior including the identification of specific strategies to do so successfully (Pender et al., 2006). The identification of perceived benefits and barriers by participants enabled them to set goals related to their fruit and vegetable intake and engage in physical activity. While participating in the intervention each participant set a personal goal that would assist them towards eating more fruits and vegetables. Participants also set a second goal that assisted them towards participating in 30 minutes of moderate physical activity on most days of the week. The supported follow-up and multiple sessions
offered by the facilitator were intended to reinforce positive behavior and promote adherence to goals.

**Behavior Outcome-Health Promoting Behavior**

According to Pender et al. (2006) the health promoting behavior is the desired behavioral end point or outcome of health decision making and preparation to action. The psychoeducation intervention emphasized that participants work towards eating recommended amount of cups of fruits and vegetables per day and participate in at least 30 minutes of physical activity most days of the week by setting individual goals. It was believed that when participants defined their goals, it assisted them to identify a plan that could lead them to change their behavior. Additionally, health-promoting lifestyle activities beyond dietary intake were assessed as an outcome.

**Summary**

The HPM was selected as the conceptual framework for the psychoeducation intervention as it identifies contextual factors that influence health behavior. Further, the model facilitated identification of components of the intervention.

**The Chronic Care Model**

The CCM was utilized to institute change during the implementation of the proposed project (Wagner, 1998). The CCM is an evidence-based initiative developed with the aim of reducing the gap between scientific advances regarding the prevention, diagnosis, monitoring and treatment of chronic diseases and subsequent health outcomes for patients. The CCM was developed for use in primary care, but it has been applied to
a variety of healthcare settings and targeted populations. The CCM model is shown in Appendix B.

The CCM was used to assess the project site prior to the implementation of the proposed intervention. The CCM focuses on interventions on six main components of care that include community resources and policies, healthcare organizations, self-management support, delivery system design, decision support, and clinical information systems. These elements are designed to work together to strengthen the provider-patient relationship and improve health outcomes. The aim of the CCM is to transform the daily care for patients with chronic illnesses from acute and reactive to proactive, planned, and population-based. At the core of this model are improved functional and clinical outcomes for patients’ disease management resulting from productive interactions between informed, activated patients and prepared, proactive teams of healthcare professionals.

**Components of Chronic Care Model**

**Community Resources and Policy**

The role of the community is to mobilize resources to meet needs of patients by encouraging patients to participate in effective community programs (Wagner, 1998). One way to achieve this goal is by forming partnerships with community organizations to support and develop interventions that fill gaps in needed services. Additionally the community should also advocate for policies to improve patient care. It was also important for the facilitator to assist participants in identifying resources in their
communities that would enable them to increase fruit and vegetable intake and participate in physical activity.

Health Care Systems

The health care system is the organization desiring to implement the CCM (Wagner, 1998). The goal of CCM is to create a culture for organizations to promote safe, high quality care. A system seeking to improve chronic illness must be motivated and prepared for change throughout the organization. It was therefore necessary to assess the organization’s perception of the proposed intervention and determine if the organization was motivated to change. It was also imperative to assess if the organization had the staff to sustain the intervention post its completion.

During the implementation of the project support from senior leadership was necessary. The facilitator of the project collaborated with the team leader for the Case Managers and the Case Managers in order to have the necessary support to implement the intervention. During the intervention at the Community Mental Health Clinic in a mid-western city in the United States, the facilitator utilized the case managers as a resource to encourage clients to participate in this psychoeducational intervention that might improve their health outcomes. The facilitator also shared the findings of the project with the leadership team of the Community Case Management after the completion of the project.

Self-Management Support

This is a key component of the CCM designed to empower and prepare patients to manage their health and health care (Wagner, 1998). To accomplish this goal during the
intervention strategies that were utilized by the facilitator included (a) assessment, (b) goal-setting, (c) action planning, (d) problem solving, (d) utilization of a placemat as a cue to remind participants to engage in health promoting behaviors, and (e) support and follow-up. Through these strategies, the facilitator formed a partnership with the participants that enhanced a collaborative approach.

**Delivery Systems Design and Decision Supports**

The role of the delivery system design is to assure the delivery of effective, efficient clinical care and self-management support (Wagner, 1998). Defining roles of team members ensures the provision of evidenced-based care. Complex patients may need more intensive management (care or case management) to optimize clinical care and self-management. The role of case managers was to identify participants that would benefit from the proposed psychoeducational intervention. During the intervention, participants received reminder phone calls from the facilitator and the case managers to remind them of appointments. At the study site, clients are usually assisted with bus tokens if they are in need of transportation. Case Managers assisted the participants with bus tokens if needed. The team leader for the Case Managers provided logistic supports. A good example was the assignment of a research room where the intervention was implemented. Additionally, an agency laptop was provided to the facilitator to use for data collection and storage during the intervention.

**Clinical Information Systems**

The role of clinical information systems is to organize patient and population data to facilitate improvement of patient care (Wagner, 1998). Ortiz (2006) indicates that
registries can be established without the availability of an electronic health record (EHR) with the use of common software tools such as Excel. The facilitator utilized an Excel spreadsheet for data collection. The project site uses CareLogic as the EHR. CareLogic is a comprehensive flexible clinical, administrative and financial management system designed specifically for behavioral health professionals for meaningful use. During the intervention, secondary data that were abstracted from the site’s EHR included participants’ diagnoses and medications. During the project, the intervention and the outcomes were not documented in the agency’s EHR.

**Summary**

The CCM was selected as it provided a conceptual framework to explore the complexities of implementing a psychoeducational intervention project in a Community Mental Health Clinic. The CCM assisted the facilitator of the intervention to engage the organization’s leadership and staff members to support the success of the implementation. The CCM also enabled the identification and utilization of agency’s resources to enhance the implementation. More importantly, the CCM assisted the facilitator to understand how to engage individuals to make informed choices that could lead to improved health outcomes.
CHAPTER 4

METHODS

The purpose of this project was to implement a psychoeducational intervention that would increase awareness of nutrition and physical activity for adults (aged 18 and above) with severe mental illness who are taking antipsychotic medications. The second purpose of the intervention was to determine if the intervention had any effect on weight, BMI, blood pressure, pulse, waist circumference, waist/hip ratio and health promoting lifestyles among this group of adults.

This chapter describes the methods and strategies that were utilized to develop and implement a psychoeducational intervention in adults on antipsychotic medications at a Community Mental Health Clinic in a mid-western city in the United States. The project was conceptualized in four phases (a) development of the intervention; (b) assessment of the project implementation site; (c) implementation of the psychoeducation interventions; and (d) analysis of outcomes of the intervention. After receiving approval from Human Research Review Committee, Grand Valley State University (Appendix C) and from the Mental Health agency (Appendix D), participants were recruited by method of referrals from case managers. The participants in the project were English speaking and were referred by the case managers from the Case Management case load. Another inclusion criterion was a participant must be taking at least one antipsychotic medication. An exclusion criterion was any patient determined to be acutely mentally ill. This is because psychoeducation is not considered an appropriate intervention in the acute phase of illness.
Study Site

The intervention was carried out at a Community Mental Health Clinic in a midwestern city in the United States in the Spring of 2014. Many of the clients served by this clinic are poor, homeless, or uninsured. The mental illnesses range from schizophrenia and bipolar disorder to anxiety disorder. These clients generally have difficulty accessing health care. Issues like alcohol abuse and drug use are also prevalent among this population. Financial difficulties were a potential barrier for participants to meet project goals. The challenges included lack of transportation and access to fruits and vegetables.

Site Population

The number of mental health clients in Spring 2014 served under the Case Management caseload consisted of 266 clients. Of the 266 clients, 135 clients (50.8%) are male, 126 clients (47.4%) female, and 5 clients (1.9%) have unknown gender. The ethnicity represented include 2 clients (0.8%) Native American, 57 clients (21.4%) Black, 20 clients (7.5%) Hispanic, 160 clients (60.2%) White, 3 clients (1.1%) Korean/Asian, 7 clients (2.6%) two or more races and 17 clients (6.4%) have their ethnicity unreported. The age representation included 60 clients (22.6%) age range 18-29, 205 clients (77.1%) age range 30-64, and 1 client (0.4%) over age 64.

Project Sample

A total of 23 participants were recruited for this project (Table 1). The sample had more males than females. Over half of the participants were White in ethnicity. The
minimum age was 25 and the maximum age was 55. The mean age for the participants was 44.96. All the 23 participants completed session 1.

Table 1
Demographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Participants who were recruited for the intervention (n=23)</th>
<th>Participants who completed the intervention (n=19)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>12</td>
<td>52.2</td>
</tr>
<tr>
<td>Black/African American</td>
<td>9</td>
<td>39.1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>Native American</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
<td>65.2</td>
</tr>
<tr>
<td>Female</td>
<td>8</td>
<td>34.8</td>
</tr>
<tr>
<td><strong>Age in Years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-35 years</td>
<td>2</td>
<td>8.6</td>
</tr>
<tr>
<td>36-45 years</td>
<td>8</td>
<td>34.4</td>
</tr>
<tr>
<td>46 - 55 years</td>
<td>13</td>
<td>55.9</td>
</tr>
</tbody>
</table>

A total of 21 participants, 14 males and 7 females, completed session 2 after which two participants dropped out. A total of 19 participants (82.6%), 12 males and 7 females completed both session 3 and 4, therefore completing the entire psychoeducational intervention. The demographic information for the 19 participants who completed the entire psychoeducation intervention is also presented in Table 1. The
common psychiatric diagnoses among the participants included major depressive disorder, bipolar disorder, schizo-affective spectrum disorders, psychotic disorders, anxiety disorders, dissociative somatoform disorders, and substance use disorders.

After the first session one white female participant voluntarily dropped out stating she was no longer interested in the intervention. The second participant to stop after completing session 1 was a White/Caucasian male participant who did not provide a reason of why he stopped the project. The third drop out was a male Black/African American participant, who cited transportation issues as the reason that he was unable to complete. The fourth male Black/African American participant stopped participating without providing a reason. His phone went unanswered when contacted to remind him of follow-up sessions. The final characteristics of the participants who completed the intervention (n=19) is similar to the original recruited group of participants. The majority of the sample were over the age of 30, similar to the population that receives services at the agency.

### Procedures for Recruitment

**Recruitment and Informed Consent**

After receiving approval from Human Research Review Committee Grand Valley State University and the Mental Health Agency, participants were recruited by method of referrals from case managers at the Agency. While clients were visiting their case managers during the months of April - June 2014, case managers used a recruitment script (Appendix E) to recruit potential participants for the intervention. The script introduced the DNP student who was the facilitator of the intervention. Additionally the
script gave an outline of the intervention including the (a) number of sessions, (b) duration of the intervention, (c) length of the sessions, (d) measures to be obtained, and (e) the purpose of the intervention. The participants who were interested and had been referred to participate in the study were provided with an informed consent form (Appendix F) after receiving a complete description of the study. The informed consent form incorporated language of the Health Insurance Portability and Accountability Act (HIPAA) to assure the confidentiality of participant data. The DNP student obtained the informed consent, while the agency supervisor came in immediately afterwards to answer questions and concerns from participants and to confirm their understanding of the project before signing off on the informed consent. Participants then received a copy of the signed informed consent.

The informed consent included information about the risks, benefits, costs and compensation of participation in the project. Participants were informed that the risks of participation in the project included loss of confidentiality. Participants were notified that to ensure that their information is protected, their data were stored in an encrypted manner. The data collection documents were also coded to keep each participant’s data together and the list of codes were destroyed when data collection was complete. Documents were kept in a locked secure location and will be destroyed three years after data collection.

**Project Procedure**

Following consent, initial data were gathered. These consisted of Health-Promoting Lifestyle Profile II questionnaire and anthropometric data. The program
consisted of four, 45 minute sessions implemented over eight weeks. The first session was primarily educational and planning. At the start of the second and third session participants received supportive follow-up for the previous educational sessions. Progress toward the attainment of previous goals was also evaluated. Additionally, if needed, the goals were revised. Participants also received phone calls as a reminder to attend their session.

After completing each individualized session, participants were verbally reminded when they should return for the next session. A phone call reminder was placed to participants the day before their session to remind them of their appointment. Some participants still had to be called on the day of the intervention if they were late for their appointment or if their phones were not answered or working on the previous day.

**Data Collection**

In this project, participants were weighed on the same scale without shoes. The facilitator of the intervention was responsible for obtaining all the anthropometric measurements. In this project, data that were obtained at the first session included gender, ethnicity, age, weight, height, blood pressure, pulse, waist size, hip size, calculated BMI, waist/hip ratio, intensity of physical activity and fruit and vegetable intake. BMI was calculated using height measured at baseline and weight obtained at each session. The National Heart Lung and Blood Institute’s BMI was used to categorize patients. A BMI of 18.5-24.9 was categorized as normal, BMI 25-29.9 was considered overweight, while a BMI of 30 or greater was considered obese. Additionally the Health-Promoting Lifestyle Profile II questionnaire was completed at the first and the last
sessions. During the second, third and fourth sessions, data that were obtained included weight, blood pressure, pulse, waist size, hip size, calculated BMI, waist/hip ratio and intensity of physical activity. Secondary information was obtained by reviewing patients’ charts to obtain information on patient diagnoses, names and doses of prescribed antipsychotic medications. Data were recorded on a participant data collection sheet (Appendix G) during the project.

**Instrument**

The Health-Promoting Lifestyle Profile II (Appendix H) measures behavior associated with health-promoting lifestyles. This instrument was utilized during the first and fourth session. The tool has 52 items and the format is a four point response scale: never, sometimes, often, and routinely and can be self-administered (Walker & Hill-Polerecky, 2011). The instrument is scored by calculating the mean of individual responses to all 52 items. The six subscales scores are similarly obtained by calculating a mean of the individual’s response to subscale items. The questions in the instrument are scored as follows: 1=never, 2=sometimes, 3=often and 4=routinely. The higher the score, the greater the improvement. The Health-Promoting Lifestyle Profile (HPLP) II has six subscales which include spiritual growth, interpersonal relations, nutrition, physical activity, health responsibility and stress management. Spiritual growth involves the sharing of thoughts and feelings through verbal and nonverbal messages. The interpersonal relations scale involves utilizing communication to achieve a sense of intimacy and closeness within meaningful, rather than more casual, relationships with others. Nutrition involves knowledgeable selection and consumption of foods essential
for sustenance, health, and well-being. Physical activity involves regular participation in light, moderate, and/or vigorous activity. Health responsibility involves an active sense of accountability for one’s own well-being. It includes paying attention to one’s own health, educating oneself about health, and exercising informed consumerism when seeking professional assistance. Stress management entails the identification and mobilization of psychological and physical resources to effectively control or reduce tension.

Walker and Hill-Polerecky (2011) calculated the test-retest reliability of the Health-Promoting Lifestyle Profile II as 0.892 after a three week interval. They reported the internal consistency as Cronbach’s alpha 0.943, while the subscales range from 0.793-0.872. In this project, the Chronbach’s alphas are displayed in Table 2 and are consistent with the prior reliabilities except for two subscales. The nutrition subscale and interpersonal relationship subscale obtained at both data collection points were lower than reported by the original authors.

Walker and Hill-Polerecky (2011), performed several validity measures. The construct validity was confirmed by factor analysis. Factor analysis confirmed the six-dimensional structure of HPLP II. Further, construct validity of the tool was supported by convergence with the Personal Lifestyle Questionnaire (r = 0.678), and by a non-significant correlation with social desirability. The HPLP II has significant criterion validity with concurrent measures of perceived health status and quality of life (r = 0.269 -0.491).
### Table 2

**Chronbach’s Alpha Reliability Scores for the HPLP II**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Cronbach’s Alpha Pre-intervention (n=23)</th>
<th>Cronbach’s Alpha Post-intervention (n=19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPLP 52 item scale</td>
<td>0.921</td>
<td>0.935</td>
</tr>
<tr>
<td>Health responsibility</td>
<td>0.739</td>
<td>0.849</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>0.833</td>
<td>0.743</td>
</tr>
<tr>
<td>Nutrition</td>
<td>0.789</td>
<td>0.448</td>
</tr>
<tr>
<td>Spiritual Growth</td>
<td>0.714</td>
<td>0.739</td>
</tr>
<tr>
<td>Interpersonal Relationship</td>
<td>0.329</td>
<td>0.614</td>
</tr>
<tr>
<td>Stress Management</td>
<td>0.810</td>
<td>0.728</td>
</tr>
</tbody>
</table>

### Intervention

The project consisted of four individualized, 45 minute psychoeducational sessions implemented over eight weeks. The participants were seen at baseline, day 16-20, day 34-38 and day 52-56. The participants participated in the intervention between the months of April to July 2014. The facilitator utilized a psychoeducational project implementation manual which outlined the session contents. Two sources of information were used to develop the psychoeducation intervention. The first source was the Supplemental Nutrition Assistance Program (SNAP) Nutrition Education and Obesity Prevention Grant Program, referred to as SNAP-Ed (United States Department of Agriculture [USDA], n.d). SNAP-Ed connection has an online resource center for state and local SNAP-Ed providers. SNAP-Ed is funded by USDA Food and Nutrition
The second source was selected sessions from Eat Smart, Live Strong tool kit. The tool kit has been designed for use among able-bodied, 60-74 year olds participating in, or eligible for, Food and Nutrition Service (FNS) nutrition assistance programs and is consistent with the 2010 Dietary Guidelines for Americans and MyPlate (USDA, 2013). The tool kit was adapted for the selected population since it is tailored for low income adults. Furthermore the recommended amount of fruit and vegetable intake for the study population was readily adjusted using available online tools such as the SuperTracker (USDA, n.d).

The sessions in the intervention stressed the importance of improving fruit and vegetable consumption and physical activity. The intervention focused on two key messages of the 2010 Dietary Guidelines for Americans (USDHHS & USDA, 2010) and utilized a variety of behavior-focused strategies to promote these behaviors: (a) increase fruit and vegetable intake by making half of your plate fruit and vegetable; (b) balance calories with physical activity to sustain a healthy weight; and (c) participate in at least 30 minutes of physical activity most days of the week. The sessions were designed to motivate and build skills in participants while utilizing self-assessment tools to assist them in achieving eating and physical activity goals.

**Session Content**

The first session was titled “Reach Your Goals, Step by Step.” The purpose of the first session was to encourage participants to eat more fruits and vegetables and to participate in more physical activity. During the first session initial data and measurements that included gender, ethnicity, age, weight, height, blood pressure, pulse,
waist size, hip size, calculated BMI, waist/hip ratio, intensity of physical activity level and fruit and vegetable intake were obtained (Appendix G). Additionally the Health-Promoting Lifestyle Profile II questionnaire was completed (Appendix H). Estimated calorie needs of each participant was determined using estimated calorie need per day by age, gender and physical activity table (Appendix I). The required amount of cups of fruits and vegetables that each participant needed to consume was determined by the facilitator using super tracker at every session. The super tracker is an online tool that can help one plan, analyze and track diet and physical activity (USDA, n.d.).

The psychoeducation module in the first session included the benefits of eating fruits and vegetables and participating in at least 30 minutes of moderate-physical activity on most days of the week. During the session each participant identified three benefits of eating the recommended amount of cups of fruits and vegetables daily. Each participant also identified three benefits of participating in at least 30 minutes of moderate-physical activity on most days of the week. All participants also listed ways in which they could be physically active. The first session also encouraged behavior change by providing participants with an opportunity to set goals and track achievement. Each participant set a personal goal towards eating the recommended cups of fruits and vegetables until the next session. Participants also set a second goal towards participating in 30 minutes of moderate-physical activity on most days of the week until the next session. Each participant received a copy of the goal setting handout (Appendix J) to monitor progress of fruit and vegetable intake and physical activity levels. The participants were also provided with measuring cups that they could use at home to measure their fruits and
vegetables. Additionally a placemat to help participants monitor their portions was provided to participants to take home. The placemat was illustrated with (a) one cup measure of fruits and vegetables, (b) a reminder to engage in physical activity, and (c) my plate logo (Appendix K). The placemat was also used as a cue to reinforce the teachings in the intervention. Samples of one cup measured fruit and vegetables were exhibited to participants during the session. A grant from Kirkhof College of Nursing, Vulnerable Population Center of Distinction, supported the purchase of these and other items used with the intervention.

The second session was titled “Challenges and Solutions.” At the start of the session, the second set of measurements were obtained. The measurements included weight, blood pressure, pulse, waist size, hip size, calculated BMI, waist/hip ratio, intensity of physical activity level and fruit and vegetable intake. The second session was designed to offer suggestions that are helpful in adapting eating and physical activity behaviors that could assist participants to reach their goals. The session also encouraged behavior change by building participants’ ability to overcome challenges. The facilitator offered supportive follow-up at the beginning of the session to participants by evaluating progress towards goal of fruit/vegetable intake and physical activity. If needed, the facilitator also assisted the participant to set new goals.

The education module in the second session focused on barriers of eating fruits and vegetables and participating in at least 30 minutes of moderate-physical activity on most days of the week. Additionally the module discussed solutions to the barriers. During the session, participants identified barriers that might prevent them from eating
more fruits and vegetables, and engaging in physical activity. Participants also identified three solutions to overcome the challenges they identified that prevented them from eating more fruits and vegetables and exercising. The facilitator offered support and necessary resources for overcoming the barriers as well as answered questions that any participant had. Once more, each participant identified three benefits of eating the recommended amount of cups of fruits and vegetables daily. Each participant also identified three benefits of participating in at least 30 minutes of moderate-physical activity on most days of the week again. For a second time, participants listed ways in which they will be physically active. Again at this session each participant set a personal goal towards eating the recommended cups of fruits and vegetables until the next session. Participants also set a second goal towards participating in 30 minutes of moderate-physical activity on most days of the week until the next session.

The third session was referred to as “Colorful and Classic Favorites.” At the start of the session measurements that were obtained included weight, blood pressure, pulse, waist size, hip size, calculated BMI, waist/hip ratio, intensity of physical activity level and fruit and vegetable intake. The facilitator offered supportive follow-up at the beginning of the session to participants by evaluating progress towards goal of fruit/vegetable intake and physical activity. If needed, the facilitator also assisted the participant to set new goals. The education module in the third session consisted of a word game (Appendix L, M) and coloring activity (Appendix N). During the word game activity, the participant was able to review the lists of challenges and solutions for eating recommended cups of fruits and vegetables each day and participating in physical activity.
activity. The participants were also exposed to hands-on experiences in updating classic recipes by adding fruits and vegetables by coloring. An easy-to-make recipe was also provided to help participants make a classic dish at home (Appendix O). Once more, each participant identified three benefits of eating the recommend amount of cups of fruits and vegetables daily. Each participant also identified three benefits of participating in at least 30 minutes of moderate-physical activity on most days of the week again. For a third time each participant listed ways in which they can be physically active. Each participant set a personal goal towards eating the recommended cups of fruits and vegetables until the next session. Participants also set a second goal towards participating in 30 minutes of moderate-physical activity on most days of the week until the next session.

The fourth session was the final session. The facilitator made a final assessment in evaluating participant progress towards goals of fruit/vegetable intake and physical activity. During the session post intervention measurements were obtained. These measurements included weight, blood pressure, pulse, waist size, hip size, calculated BMI, waist/hip ratio, intensity of physical activity and fruit and vegetable intake. The Health-Promoting Lifestyle Profile II was also completed for a second time as a post-test. During the session the facilitator discussed with the individual participants the goals and the progress they made during the intervention. Participants were also encouraged to continue with the lifestyle changes that were emphasized in the intervention. Each participant set a personal goal towards eating the recommended cups of fruits and vegetables after the completion of the intervention. Participants also set a second goal
towards participating in 30 minutes of moderate-physical activity on most days of the week after the completion of the intervention.
CHAPTER 5
RESULTS

The purpose of this project was to implement a psychoeducational intervention that would increase awareness of nutrition and physical activity for adults (aged 18 and above) with severe mental illness who are taking antipsychotic medications. The second purpose of the intervention was to determine if the intervention had any effect on weight, BMI, blood pressure, pulse, waist circumference, waist/hip ratio and health promoting lifestyles among this group of adults. This chapter reports the key study outcomes. The chapter also reflects responses from the participants to the Health-Promoting Lifestyle Profile II questionnaire.

Fruit and Vegetable Intake

Results show that there was an increase in both fruit and vegetable intake among the 19 participants who completed the study (Table 3). The mean of the fruit intake for the 19 participants at the start of the program was 8.73 cups/2weeks and 20.31 cups/2weeks at the end of the program. A paired t-test found that the increased fruit intake was statistically significant p = 0.001 (Table 3). Similarly, a paired sample t-test comparing vegetable intake found that increased vegetable intake was statistically significant p = 0.001. The vegetable intake was lower at the start of the program (mean= 15.85 cups/2 weeks) than at the end of the program (mean= 38.45 cups/2 weeks) among the 19 participants (Table 3).
Table 3

*Paired Samples t-Test Results for Health-Related Behavioral Changes Reported for the Prior Two Weeks*

<table>
<thead>
<tr>
<th>HPLP Scale</th>
<th>Group Means</th>
<th>SD</th>
<th>Mean difference</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Activity Pre</td>
<td>172.10</td>
<td>160.81</td>
<td>-187.90</td>
<td>225.13</td>
<td>3.63</td>
<td>18</td>
<td>0.002*</td>
</tr>
<tr>
<td>Physical Activity Post</td>
<td>360.00</td>
<td>275.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable Intake Pre</td>
<td>15.85</td>
<td>10.53</td>
<td>-22.60</td>
<td>25.68</td>
<td>3.93</td>
<td>18</td>
<td>0.001*</td>
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<tr>
<td>Vegetable Intake post</td>
<td>38.45</td>
<td>24.76</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Fruit Intake pre</td>
<td>8.73</td>
<td>8.99</td>
<td>-11.58</td>
<td>12.52</td>
<td>4.02</td>
<td>18</td>
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</tr>
<tr>
<td>Fruit Post</td>
<td>20.31</td>
<td>12.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* *significant p value.
Physical Activity

Results show that there was an increase in time spent in physical activity among the 19 participants who completed the study (Table 3). The mean of physical activity minutes for the 19 participants at the start of the program was 172.10 minutes/2 weeks and 360.00 minutes/2 weeks at the end of the program. Paired sample t-test comparing the time spent in physical activity before and after the intervention was significant (p = 0.002).

Weight and BMI

For the 19 participants who completed the project, the minimum weight at the beginning of the intervention was 131 pounds while the maximum weight was 337 pounds. Table 4 show the weight characteristics for the 19 participants at the start and the end of the program. Result show that overall, 12 (63%) participants who completed the program lost weight over the 8 weeks of the intervention. The range of weight loss among these participants was 0.25 to 10 pounds. One participant maintained the pre intervention weight while a total of 6 participants had an increase in their post intervention weight. The mean of the weight for the 19 participants at the start of the program was 221.46 pounds and 219.82 pounds at the end of the program. Despite the weight loss by some participants, results of paired sample t-test comparing the weight before and after the intervention was not significant p value = 0.184 (Table 5).

Of the 19 participants who completed the study, three (15.8%) had a normal BMI of 18.5-24.9, while four (21.5%) participants were overweight with a BMI 25-29.9 at the
start of the intervention (Table 6). A total of 12 (63.1%) of the participants had a BMI of 30 or greater, therefore considered obese. These BMI cut off points are determined by the

Table 4

*Weight at the Start and the End of the Intervention*

<table>
<thead>
<tr>
<th>Participant ID</th>
<th>Weight at the start</th>
<th>Weight at the end</th>
<th>ΔWeight</th>
</tr>
</thead>
<tbody>
<tr>
<td>014</td>
<td>174.75</td>
<td>164.75</td>
<td>-10.00</td>
</tr>
<tr>
<td>012</td>
<td>239.00</td>
<td>231.00</td>
<td>-8.00</td>
</tr>
<tr>
<td>006</td>
<td>169.25</td>
<td>161.75</td>
<td>-7.50</td>
</tr>
<tr>
<td>023</td>
<td>297.25</td>
<td>291.00</td>
<td>-6.25</td>
</tr>
<tr>
<td>021</td>
<td>140.00</td>
<td>134.00</td>
<td>-6.00</td>
</tr>
<tr>
<td>009</td>
<td>275.00</td>
<td>269.00</td>
<td>-6.00</td>
</tr>
<tr>
<td>011</td>
<td>248.00</td>
<td>243.75</td>
<td>-4.25</td>
</tr>
<tr>
<td>022</td>
<td>258.50</td>
<td>255.00</td>
<td>-3.50</td>
</tr>
<tr>
<td>004</td>
<td>131.00</td>
<td>129.00</td>
<td>-2.00</td>
</tr>
<tr>
<td>018</td>
<td>305.25</td>
<td>303.25</td>
<td>-2.00</td>
</tr>
<tr>
<td>017</td>
<td>197.50</td>
<td>197.00</td>
<td>-0.50</td>
</tr>
<tr>
<td>010</td>
<td>181.50</td>
<td>181.25</td>
<td>-0.25</td>
</tr>
<tr>
<td>020</td>
<td>166.00</td>
<td>166.00</td>
<td>0.00</td>
</tr>
<tr>
<td>007</td>
<td>150.50</td>
<td>151.25</td>
<td>+0.75</td>
</tr>
<tr>
<td>016</td>
<td>239.00</td>
<td>239.75</td>
<td>+0.75</td>
</tr>
<tr>
<td>015</td>
<td>198.25</td>
<td>202.25</td>
<td>+4.00</td>
</tr>
<tr>
<td>008</td>
<td>287.00</td>
<td>291.25</td>
<td>+4.25</td>
</tr>
<tr>
<td>019</td>
<td>337.00</td>
<td>343.25</td>
<td>+6.25</td>
</tr>
<tr>
<td>004</td>
<td>213.00</td>
<td>222.00</td>
<td>+9.00</td>
</tr>
</tbody>
</table>
### Table 5

*Paired Sample t-Test for Biological Variables*

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>Mean Difference</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight pre</td>
<td>221.46</td>
<td>60.82</td>
<td>1.63</td>
<td>5.15</td>
<td>1.38</td>
<td>18</td>
<td>0.184</td>
</tr>
<tr>
<td>Weight post</td>
<td>219.82</td>
<td>61.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI pre</td>
<td>33.13</td>
<td>9.27</td>
<td>0.23</td>
<td>0.78</td>
<td>1.31</td>
<td>18</td>
<td>0.206</td>
</tr>
<tr>
<td>BMI post</td>
<td>32.89</td>
<td>9.55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waist pre</td>
<td>44.68</td>
<td>7.37</td>
<td>0.63</td>
<td>1.59</td>
<td>1.73</td>
<td>18</td>
<td>0.100</td>
</tr>
<tr>
<td>Waist post</td>
<td>44.04</td>
<td>7.68</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hip Pre</td>
<td>46.94</td>
<td>6.08</td>
<td>1.38</td>
<td>1.19</td>
<td>5.04</td>
<td>18</td>
<td>0.0001*</td>
</tr>
<tr>
<td>Hip Post</td>
<td>45.56</td>
<td>6.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waist: Hip pre</td>
<td>0.95</td>
<td>0.10</td>
<td>-0.01</td>
<td>0.03</td>
<td>-1.75</td>
<td>18</td>
<td>0.097</td>
</tr>
<tr>
<td>Waist: Hip post</td>
<td>0.96</td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic BP pre</td>
<td>124.32</td>
<td>11.93</td>
<td>1.68</td>
<td>13.75</td>
<td>0.53</td>
<td>18</td>
<td>0.600</td>
</tr>
<tr>
<td>Systolic BP post</td>
<td>122.63</td>
<td>15.32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diastolic BP pre</td>
<td>81.63</td>
<td>6.18</td>
<td>-0.63</td>
<td>7.96</td>
<td>-0.35</td>
<td>18</td>
<td>0.733</td>
</tr>
<tr>
<td>Diastolic BP post</td>
<td>82.26</td>
<td>8.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse pre</td>
<td>82.47</td>
<td>15.41</td>
<td>1.94</td>
<td>12.05</td>
<td>0.70</td>
<td>18</td>
<td>0.490</td>
</tr>
<tr>
<td>Pulse post</td>
<td>80.53</td>
<td>10.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* *significant* p value.
Table 6

*BMI at the Start and the End of the Intervention*

<table>
<thead>
<tr>
<th>Participant ID</th>
<th>BMI at the start</th>
<th>BMI at the end</th>
<th>ΔBMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>014</td>
<td>27.37</td>
<td>26.00</td>
<td>-1.37</td>
</tr>
<tr>
<td>012</td>
<td>35.29</td>
<td>34.11</td>
<td>-1.18</td>
</tr>
<tr>
<td>021</td>
<td>22.59</td>
<td>21.63</td>
<td>-0.96</td>
</tr>
<tr>
<td>009</td>
<td>43.07</td>
<td>42.13</td>
<td>-0.94</td>
</tr>
<tr>
<td>023</td>
<td>38.16</td>
<td>37.36</td>
<td>-0.80</td>
</tr>
<tr>
<td>010</td>
<td>26.04</td>
<td>25.33</td>
<td>-0.71</td>
</tr>
<tr>
<td>006</td>
<td>26.51</td>
<td>25.80</td>
<td>-0.71</td>
</tr>
<tr>
<td>011</td>
<td>34.59</td>
<td>33.99</td>
<td>-0.60</td>
</tr>
<tr>
<td>022</td>
<td>34.10</td>
<td>33.64</td>
<td>-0.46</td>
</tr>
<tr>
<td>005</td>
<td>21.80</td>
<td>21.46</td>
<td>-0.34</td>
</tr>
<tr>
<td>018</td>
<td>40.27</td>
<td>40.00</td>
<td>-0.27</td>
</tr>
<tr>
<td>017</td>
<td>32.86</td>
<td>32.78</td>
<td>-0.08</td>
</tr>
<tr>
<td>020</td>
<td>28.49</td>
<td>28.49</td>
<td>0.00</td>
</tr>
<tr>
<td>007</td>
<td>20.99</td>
<td>21.09</td>
<td>+0.10</td>
</tr>
<tr>
<td>016</td>
<td>32.41</td>
<td>32.64</td>
<td>+0.23</td>
</tr>
<tr>
<td>015</td>
<td>31.99</td>
<td>32.51</td>
<td>+0.52</td>
</tr>
<tr>
<td>008</td>
<td>43.63</td>
<td>44.28</td>
<td>+0.65</td>
</tr>
<tr>
<td>019</td>
<td>59.69</td>
<td>60.84</td>
<td>+1.15</td>
</tr>
<tr>
<td>004</td>
<td>29.70</td>
<td>30.96</td>
<td>+1.26</td>
</tr>
</tbody>
</table>
American Heart Association (2013). The mean of the BMI for the 19 participants at the start of the program was 33.13, and 32.89 at the end of the program (Table 5). The paired sample t-test comparing BMI before and post intervention also had a non-significant p value = 0.206 (Table 5).

**Waist Circumference, Hip Size and Waist/Hip Ratio**

Waist circumference which is a measure of central adiposity is now considered to be a more valid predictor for risks for cardiovascular disease, type 2 diabetes and other metabolic risk-related conditions compared to BMI (National Institute of Health [NIH], 2011). Waist circumference greater than 35 inches for women and 40 inches for men is indicative of increased cardiometabolic risk (Jensen et al., 2013). A total of six (85.7%) out of the seven women and nine (75%) of twelve males who completed the intervention were above this cutoff at the start of the intervention (Table 7) indicating the group had increased cardiometabolic risk. The mean for the waist circumference for the 19 participants at the start of the program was 44.68 and 44.05 at the end of the program (Table 5). A paired t-test comparing the waist circumference at the start and the end of the intervention was statistically non-significant (p value = 0.184).

Hip circumference when used in conjunction with waist circumference facilitates the measurement of central adiposity. For the 19 participants who completed the project, a paired t-test found that hip size change had a statistically significant p value = 0.0001. The hip size was lower at the end, mean=45.56 inches, than at the start of the intervention, mean = 46.94 inches (Table 5).
Table 7

*Waist Circumference Before and After the Intervention by Gender and Descending Change*

<table>
<thead>
<tr>
<th>Participant ID</th>
<th>Gender</th>
<th>Waist at the start</th>
<th>Waist at the end</th>
<th>ΔWaist</th>
</tr>
</thead>
<tbody>
<tr>
<td>022</td>
<td>male</td>
<td>49.01</td>
<td>45.87</td>
<td>-3.14</td>
</tr>
<tr>
<td>012</td>
<td>male</td>
<td>50.00</td>
<td>47.44</td>
<td>-2.56</td>
</tr>
<tr>
<td>004</td>
<td>male</td>
<td>45.00</td>
<td>47.64</td>
<td>-2.00</td>
</tr>
<tr>
<td>014</td>
<td>male</td>
<td>42.00</td>
<td>40.55</td>
<td>-1.45</td>
</tr>
<tr>
<td>010</td>
<td>male</td>
<td>37.00</td>
<td>35.63</td>
<td>-1.37</td>
</tr>
<tr>
<td>018</td>
<td>male</td>
<td>55.30</td>
<td>54.92</td>
<td>-0.38</td>
</tr>
<tr>
<td>009</td>
<td>male</td>
<td>53.00</td>
<td>52.56</td>
<td>-0.44</td>
</tr>
<tr>
<td>007</td>
<td>male</td>
<td>29.13</td>
<td>29.13</td>
<td>0.00</td>
</tr>
<tr>
<td>016</td>
<td>male</td>
<td>48.62</td>
<td>48.62</td>
<td>0.00</td>
</tr>
<tr>
<td>006</td>
<td>male</td>
<td>40.98</td>
<td>39.57</td>
<td>+1.41</td>
</tr>
<tr>
<td>023</td>
<td>male</td>
<td>48.80</td>
<td>47.83</td>
<td>+0.97</td>
</tr>
<tr>
<td>005</td>
<td>male</td>
<td>34.01</td>
<td>34.84</td>
<td>+0.83</td>
</tr>
<tr>
<td>021</td>
<td>female</td>
<td>32.48</td>
<td>28.74</td>
<td>-3.74</td>
</tr>
<tr>
<td>017</td>
<td>female</td>
<td>46.26</td>
<td>44.09</td>
<td>-2.17</td>
</tr>
<tr>
<td>011</td>
<td>female</td>
<td>45.98</td>
<td>45.47</td>
<td>-0.51</td>
</tr>
<tr>
<td>008</td>
<td>female</td>
<td>55.00</td>
<td>54.92</td>
<td>-0.08</td>
</tr>
<tr>
<td>015</td>
<td>female</td>
<td>46.26</td>
<td>47.64</td>
<td>+1.38</td>
</tr>
<tr>
<td>019</td>
<td>female</td>
<td>48.22</td>
<td>49.41</td>
<td>+1.19</td>
</tr>
<tr>
<td>020</td>
<td>female</td>
<td>41.93</td>
<td>42.04</td>
<td>+0.11</td>
</tr>
</tbody>
</table>
Calculated waist-hip ratio (waist circumference divided by hip circumference) of participants is shown in Table 8. Waist-hip ratio measures body fat distribution and has

Table 8

*Waist-Hip Ratio Before and After the Intervention by Gender*

<table>
<thead>
<tr>
<th>Participant ID</th>
<th>Gender</th>
<th>Ratio at the start</th>
<th>Ratio at the end</th>
<th>ΔRatio</th>
</tr>
</thead>
<tbody>
<tr>
<td>022</td>
<td>male</td>
<td>0.99</td>
<td>0.94</td>
<td>-0.05</td>
</tr>
<tr>
<td>010</td>
<td>male</td>
<td>0.89</td>
<td>0.86</td>
<td>-0.03</td>
</tr>
<tr>
<td>009</td>
<td>male</td>
<td>1.02</td>
<td>1.00</td>
<td>-0.02</td>
</tr>
<tr>
<td>014</td>
<td>male</td>
<td>0.90</td>
<td>0.95</td>
<td>+0.05</td>
</tr>
<tr>
<td>007</td>
<td>male</td>
<td>0.72</td>
<td>0.77</td>
<td>+0.05</td>
</tr>
<tr>
<td>004</td>
<td>male</td>
<td>1.01</td>
<td>1.06</td>
<td>+0.05</td>
</tr>
<tr>
<td>016</td>
<td>male</td>
<td>1.07</td>
<td>1.10</td>
<td>+0.03</td>
</tr>
<tr>
<td>005</td>
<td>male</td>
<td>0.87</td>
<td>0.89</td>
<td>+0.02</td>
</tr>
<tr>
<td>018</td>
<td>male</td>
<td>1.08</td>
<td>1.10</td>
<td>+0.02</td>
</tr>
<tr>
<td>006</td>
<td>male</td>
<td>0.97</td>
<td>0.98</td>
<td>+0.01</td>
</tr>
<tr>
<td>023</td>
<td>male</td>
<td>0.96</td>
<td>0.97</td>
<td>+0.01</td>
</tr>
<tr>
<td>012</td>
<td>male</td>
<td>1.06</td>
<td>1.07</td>
<td>+0.01</td>
</tr>
<tr>
<td>021</td>
<td>female</td>
<td>0.83</td>
<td>0.77</td>
<td>-0.06</td>
</tr>
<tr>
<td>011</td>
<td>female</td>
<td>0.92</td>
<td>0.92</td>
<td>0.00</td>
</tr>
<tr>
<td>017</td>
<td>female</td>
<td>0.99</td>
<td>0.99</td>
<td>0.00</td>
</tr>
<tr>
<td>008</td>
<td>female</td>
<td>1.01</td>
<td>1.06</td>
<td>+0.05</td>
</tr>
<tr>
<td>015</td>
<td>female</td>
<td>1.08</td>
<td>1.11</td>
<td>+0.03</td>
</tr>
<tr>
<td>020</td>
<td>female</td>
<td>0.91</td>
<td>0.94</td>
<td>+0.03</td>
</tr>
<tr>
<td>019</td>
<td>female</td>
<td>0.75</td>
<td>0.79</td>
<td>+0.04</td>
</tr>
</tbody>
</table>
been found to be better in determining visceral fat than BMI (Seidell et al., 1989). In some studies waist-hip ratio has also been found to be positively associated with incidence of myocardial infarction, stroke, and death from all causes in men and women after adjusting for BMI (Larrson et al., 1984). Waist/hip ratio greater than 0.90 cm in men and 0.85 cm in women is indicative of increased cardiometabolic risk (USDA, 1990). A total of five (71.4%) out of the seven women and eight (66.6%) of twelve males who completed the intervention were above this cutoff at the recruitment (Table 8) indicating the group had increased cardiometabolic risk. The mean of waist/hip ratio for the 19 participants at the start of the intervention was 0.95, and 0.96 at the end of the intervention (Table 5). A paired sample t-test comparing the waist/hip ratio at the start and the end of intervention was statistically non-significant with a p value of 0.97.

**Systolic and Diastolic Blood Pressure**

A total of three of the nineteen participants who completed the intervention had blood pressure greater than 140/90, while two of the nineteen participants had blood pressure greater than 130/85 at the start of the intervention. A blood pressure of 130/85 or higher is considered a metabolic risk factor (NIH, 2011). The mean for systolic blood pressure for the 19 participants at the start of the program was 124.32 and 122.63 at the end of the intervention. A paired t-test comparing the systolic blood pressure at the start and the end of the intervention was statistically non-significant, p value = 0.600 (Table 5). The mean for diastolic blood pressure for the 19 participants at the start of the program was 81.63 and 82.26 at the end of the program. Similarly, a paired t-test
comparing the diastolic blood pressure at the start and the end of the intervention was statistically non-significant, p value = 0.733 (Table 5)

**Pulse**

The mean for the pulse rate for the 19 participants at the start of the program was 82.47 and 80.53 at the end of the program (Table 5). A paired t-test comparing the pulse at the start and the end of the intervention was statistically non-significant, p value = 0.490 (Table 5).

**Results for Health-Promoting Lifestyle Profile II**

The pre- and post- Health-Promoting Lifestyle Profile II questionnaire (Appendix H) scores were analyzed using paired t-tests. Results for the paired sample t-test for Health-Promoting Lifestyle Profile II are presented in Table 9. The paired t-test for the 52-item pre-intervention Lifestyle Profile II and post-intervention Lifestyle Profile II was significant (p=0.026). The paired t-test for pre-intervention Physical Activity and post-intervention Physical Activity subscale was also significant (p=0.044). Finally, the paired t-test for pre-intervention Spiritual Growth and post-intervention Spiritual Growth subscale was also significant (p = 0.012). All of these scales increased during the intervention. No other subscales showed a significant change.

The items on the physical activity subscale include (a) following a planned exercise program, (b) type and time spent in physical activity, (c) engaging in physical activity as a form of recreation or daily activities, and (d) checking pulse and reaching target heart rate when exercising. The items on spiritual growth include (a) changing in positive ways, (b) life having a purpose, (c) looking forward to the future, (d) feeling
content with self, (e) working toward long term goals, (f) exposing self to new experiences and challenges, (g) finding one’s days interesting, (h) being aware of what is important in life, and (i) feeling connected with a greater force.

**Other Findings**

**Goal Setting and Participants**

The goals that pertain to fruit and vegetable intake and physical activity for three participants who lost the most weight and three who gained the most weight are presented in Table 10. The goals of the participants who lost the most weight during the intervention were generally consistent related to increasing the intake of fruits and vegetables as well as physical activity. The majority of the participants who lost weight at the end of the intervention indicated that they would engage in at least three days of 30 minutes or greater of physical activity for at least three days or more each week. Two participants who planned to participate in seven days of physical activity after the first session, as well as increase their intake of cups of fruits and vegetables, lost 7.5 pounds and 10 pounds. At the end of the intervention, interestingly, the participant who had lost 10 pounds indicated that he would maintain physical activity at 30 minutes seven days a week, but decrease his intake of fruit and vegetable to 1 cup daily.

The participants who gained the most weight also made relatively consistent goals pertaining to their fruit and vegetable intake, and physical activity (Table 10). However, a few of the participants also made inconsistent goals. After examining the goal setting of all participants the consistency of goal setting had little impact on biological outcomes.
### Table 9

**Paired Samples t-Test for the Total and Subscales of the Health-Promoting Lifestyle Profile II**

<table>
<thead>
<tr>
<th>HPLP II Scale</th>
<th>Mean</th>
<th>SD</th>
<th>Mean difference</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPLP II pre</td>
<td>2.498</td>
<td>0.482</td>
<td>-0.233</td>
<td>0.420</td>
<td>-2.426</td>
<td>0.026*</td>
</tr>
<tr>
<td>HPLP II post</td>
<td>2.732</td>
<td>0.502</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health responsibility pre</td>
<td>2.495</td>
<td>0.660</td>
<td>0.003</td>
<td>0.638</td>
<td>0.025</td>
<td>0.980</td>
</tr>
<tr>
<td>Health responsibility post</td>
<td>2.492</td>
<td>0.775</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Activity pre</td>
<td>2.143</td>
<td>0.763</td>
<td>-0.322</td>
<td>0.649</td>
<td>-2.164</td>
<td>0.044*</td>
</tr>
<tr>
<td>Physical Activity Post</td>
<td>2.466</td>
<td>0.658</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutrition pre</td>
<td>2.362</td>
<td>0.665</td>
<td>-0.321</td>
<td>0.879</td>
<td>-1.592</td>
<td>0.129</td>
</tr>
<tr>
<td>Nutrition Post</td>
<td>2.684</td>
<td>0.847</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spiritual Growth pre</td>
<td>2.631</td>
<td>0.565</td>
<td>-0.309</td>
<td>0.446</td>
<td>-2.809</td>
<td>0.012*</td>
</tr>
<tr>
<td>Spiritual Growth Post</td>
<td>2.941</td>
<td>0.553</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal Relationship pre</td>
<td>2.820</td>
<td>0.384</td>
<td>-0.185</td>
<td>0.446</td>
<td>-1.812</td>
<td>0.087</td>
</tr>
<tr>
<td>Interpersonal Relationship post</td>
<td>3.005</td>
<td>0.445</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress Management Pre</td>
<td>2.485</td>
<td>0.766</td>
<td>-0.264</td>
<td>0.629</td>
<td>-1.784</td>
<td>0.092</td>
</tr>
<tr>
<td>Stress Management Post</td>
<td>2.750</td>
<td>0.640</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* * significant p value.
### Table 10

**Summary of Goals for Some Participants Who Lost the Most Weight Compared to Those who Gained the Most Weight**

<table>
<thead>
<tr>
<th>ID</th>
<th>ΔW</th>
<th>F</th>
<th>V</th>
<th>PA</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>Session 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>014</td>
<td>-10.00</td>
<td>1.5</td>
<td>2</td>
<td>30min. 4d/wk</td>
<td>2</td>
<td>2</td>
<td>30min/7d/wk</td>
<td>2</td>
</tr>
<tr>
<td>012</td>
<td>-8.00</td>
<td>2</td>
<td>3</td>
<td>45min.5d/wk</td>
<td>2</td>
<td>3</td>
<td>30min/5d/wk</td>
<td>2</td>
</tr>
<tr>
<td>006</td>
<td>-7.50</td>
<td>3</td>
<td>4</td>
<td>30min/5d/wk</td>
<td>3</td>
<td>3</td>
<td>30min/7d/wk</td>
<td>3</td>
</tr>
<tr>
<td>008</td>
<td>+4.25</td>
<td>2</td>
<td>3</td>
<td>15min/5d/wk</td>
<td>3</td>
<td>2</td>
<td>25min/5d/wk</td>
<td>2</td>
</tr>
<tr>
<td>019</td>
<td>+6.25</td>
<td>2</td>
<td>3</td>
<td>30min/3d/wk</td>
<td>1.25</td>
<td>2</td>
<td>30min/3d/wk</td>
<td>1.5</td>
</tr>
<tr>
<td>004</td>
<td>+9.00</td>
<td>2</td>
<td>3.5</td>
<td>30min/5d/wk</td>
<td>2</td>
<td>3.5</td>
<td>30min/5d/wk</td>
<td>2</td>
</tr>
</tbody>
</table>

*Note.* ΔW = change in weight; F = daily cups of fruits; V = daily cups of vegetables; PA = physical activity; min = minutes; d/wk= days per week.
Barriers and Solutions to Increasing Fruit and Vegetable Intake

During the second and third sessions, participants shared with the facilitator the barriers to reaching their goals. They then participated in a problem-solving exercise to find solutions to the barriers that prevented them from meeting their fruit and vegetable intake goals. Table 11 represents a summary of barriers that were shared by participants. Stress and depression were identified as affecting the emotional well-being of some participants and prevented them from attaining their goals. Other health issues, which affected some participants’ ability to meet their fruit and vegetable intake goals, were identified as including tooth pain and diarrhea. Some participants indicated that they had difficulty affording fruits and vegetables or had run out of their food stamps.

Access to fruits and vegetables seemed to be a key concern to some participants. Some participants who lived in adult foster care (AFC) homes indicated that fruits and vegetables were not provided in their living setting. Lack of transportation was mentioned by a participant as a barrier that affected the intake. Lack of support from family and friends was also reported as a factor that affected fruit and vegetable intake. Lack of storage space was cited by one participant. Some participants mentioned that they found it difficult to change their prior behaviors. Busy schedules also affected participants’ ability to attain their fruit and vegetable intake goals.

Participants were also able to find solutions to the barriers that prevented them from increasing their fruit and vegetable intake. This is evident in Table 11 where fewer barriers were identified at session 3. Participants identified relaxation techniques as a means of reducing stress. Participants who indicated that their depression affected their
goals were able to identify that they would seek assistance immediately from their case worker, psychiatrists, or psychologist for depression.

Table 11

**Barriers to Increasing Fruit and Vegetable Intake**

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Session 2 n reporting</th>
<th>Session 3 n reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of time</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Dislike of fruit and vegetable</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Affordability</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Lack of access</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Depression</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Lack of time</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Difficult to change</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lack of transportation</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Health Problems</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Lack of family/friends support</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Fruit/vegetable going stale</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lack of storage space</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Craving unhealthy foods</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Total number of barriers 24 8

Participants with dental problems also stated they were going to follow through with the dentist or oral surgeon. One participant, who had reported that a busy schedule was a barrier, indicated that packing fruits and vegetables to take along in the car would
be a solution. Having a schedule for eating fruits and vegetables was also mentioned as a solution that would assist to increase intake.

One participant indicated that eating fruits and vegetables prior to eating other foods would be beneficial. Adding spices to the vegetables was also identified as a solution to improving intake. Eating fruits for dessert was identified as a solution that could promote fruit intake. Eating fruits and vegetables consistently was also mentioned as one solution that could promote intake. Since affordability of fruits and vegetables was a concern, one participant indicated that he had requested the AFC home owner to provide him with fruits and vegetables.

Buying fruits and vegetables during sales was also mentioned by participants as one method of overcoming the barriers. Participants also indicated that it would be helpful to learn to budget and buy and stock their fruits and vegetables when they had food stamps. Buying just enough fruits and vegetables was identified by one participant as a solution to preventing the supply from going stale while also addressing the problem of inadequate storage space. To counter transportation barriers, participants identified that they could walk to the store. Additionally, some participants indicated that they would seek assistance from the case managers to provide them with bus tokens in order to have transportation means to the grocery store.

**Facilitators of Increasing Fruit and Vegetable Intake**

During the second and third session, participants also shared with the facilitator the reasons that had made them successful in increasing their fruit and vegetable intake.
Several participants indicated that they had been successful in increasing their fruits and vegetable intake because they had free meals at a local feeding center.

Table 12

Facilitators of Increase in Fruit and Vegetable Intake

<table>
<thead>
<tr>
<th>Facilitator</th>
<th>Session 2 n reporting</th>
<th>Session 3 n reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of fruits and vegetables</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Desire to eat healthy</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Desire to lose weight</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Routinely eats fruits and vegetables</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Liking fruit and vegetables</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Information, goals and resources from the project</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Adding spices/seasoning to vegetables</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Routinely/raised eating fruits and vegetables</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Motivation</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Family support</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Eliminating unhealthy snacks</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Trying new recipes</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total number of facilitators</strong></td>
<td><strong>22</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

One participant stated that his AFC home had started providing fruits and vegetables in order for the participant to meet his project goals. Some participants attributed their success at increasing fruit and vegetable intake to the desire to eat healthy while others wanted to lose weight. Other participants indicated that they liked eating
fruits and vegetables. Some participants indicated that their success was due to the motivation to meet their project goals. One participant was motivated by the personal reason to lose weight as she was participating in a family member’s wedding. One participant indicated that cutting down unhealthy snacks had facilitated him being successful in increasing his intake of fruits and vegetables. Adding dressing and seasoning to vegetables was cited as a reason that enabled a participant to increase fruit and vegetable intake. Some participants attributed their success in increasing fruit and vegetable intake as resulting from the information that they obtained from the psychoeducation intervention.

**Barriers and Solutions for Increasing Engagement in Physical Activity**

During the second and third sessions, participants also shared barriers that had prevented them from meeting their physical activity goals. Following barrier identification, they problem-solved to find solutions to the barriers. Barriers to physical activity are represented in Table 13. Health problems including chronic pain, arthritis and neuropathy were identified by some participants to have affected their ability to meet their physical activity goals. Bad weather that included cold weather, rain, snow, and heat also affected the participants’ ability to meet their physical activity goals. Busy schedules, lack of motivation and fatigue were identified by participants as having affected their physical activity goals. One participant was concerned about the safety of the environment in which she engaged in physical activity.

In regards to chronic pain, participants identified the need to engage in physical activity when they had no pain. Maintaining activity as tolerated and taking pain
medication as directed by their health care providers was also provided as a solution to the physical activity barrier. Participants also identified the need to avoid a sedentary lifestyle. Motivating self to engage in physical activity, and seeking support from and exercising with family members were cited as ways of improving engagement in physical activity.

Table 13

*Barriers to Physical Activity*

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Session 2 n reporting</th>
<th>Session 3 n reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health issues</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Unfavorable weather</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Fatigue</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Lack of motivation</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Lack of time</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Safety Concerns</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total number of barriers** 14 8

Having a set schedule for physical activity was also mentioned as helpful. In order to overcome the bad weather, participants indicated that they could engage in physical activity in the house or postpone activity to a favorable day. The participant who was concerned about safety stated that finding a park with lots of people and also focusing on positive thoughts would be helpful. One participant indicated that seeking
assistance from the case manager would be instrumental in identification of a discounted gym membership.

**Facilitators of Increase in Physical Activity in Participants**

During the second and third session, participants also shared the reasons that had made them successful in increasing the time that they participated in physical activity (Table 14).

Table 14

*Facilitators of Engagement in Physical Activity*

<table>
<thead>
<tr>
<th>Facilitator</th>
<th>Session 2 n reporting</th>
<th>Session 3 n reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job requires physical activity</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Lose weight</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Daily routine involve physical activity</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Scheduling physical activity</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Desire for healthy lifestyle</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Motivation</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Relaxation</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Project goals</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Personal reasoning (wedding)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Enjoys physical activity</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Family/friends support</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Favorable weather</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total number of facilitators</strong></td>
<td><strong>26</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>
Participants indicated that favorable weather conditions increased their ability to engage in physical activity. Some participants indicated that health benefits that included improvement of arthritis symptoms and stress reduction made them engage in physical activity. Use of music while engaging in physical activity increased the success of one participant.

Some participants indicated that support from family and friends made them successful. The desire to change and improve overall health was also a motivator for some participants. Some participants indicated that what motivated them to be successful in physical activity was their commitment to keep their project goals. Other participants stated that the benefits of physical activity that included improvement of their shape, muscle strength and reduction of belly fat. Other reasons for success in engaging in physical activity included enjoyment that was derived by participants. Motivation to lose weight was also reported by a participant. One participant reported that he was successful in participating in physical activity because he was now his own cheer leader. One participant stated he was successful in engaging in physical activity when he was well rested.

**Barriers and Facilitators of Weight Loss or Gain in Participants**

Some of the common themes among the participants who lost weight during the intervention emerged related to why they were successful. They included access to availability of fruits and vegetables, (b) desire to lose weight and maintain a healthy body weight, (c) commitment to their project goals, (d) increased motivation, and (e)
adherence to the teaching from the project. Overall the themes reflect that they were eating better and were physically active.

Of the participants who gained weight, the indicated key barriers included (a) fatigue, (b) bad weather, (c) lack of access to fruit and vegetables, (d) lack of motivation, and (e) safety concerns. It is also notable that some of the participants who gained weight had a high baseline weight to begin with. However, there are exceptions, for example one participant whose baseline weight was 297.25 pounds was able to lose 6.25 pounds at the end of the intervention. Some participants who indicated that they did not have barriers when it came to increasing their physical activity as well as intake of fruits and vegetables still gained weight.
CHAPTER 6
DISCUSSION

The purpose of this project was to implement a psychoeducational intervention that would increase awareness of nutrition and physical activity for adults (aged 18 and above) with severe mental illness who are taking antipsychotic medications. The second purpose of the intervention was to determine if the intervention had any effect on weight, BMI, blood pressure, pulse, waist circumference, waist/hip ratio and health promoting lifestyles among this group of adults. The objective of this chapter is to discuss the nutrition, physical activity and physiological outcomes. Additionally, Health-Promoting Lifestyle Profile II questionnaire outcomes are discussed. The strengths and limitations of the intervention are presented. In addition, the implications for nursing practice are highlighted. This chapter also includes a discussion of the implications for future study. In writing this chapter, the role of the DNP-prepared clinician is also highlighted. The sustainability of the psychoeducational program in the community health clinic is also discussed.

Discussion of Results

The need to implement non-pharmacological interventions in the management of weight and physical illness through patient education has been supported by various meta-analyses and literature. The literature reviewed in the project supported the use of psychoeducation that focuses on nutrition and exercise to manage people in the target patient population (Menza et al., 2004). Vreeland et al. (2010) supported the use of similar interventions for promoting healthier lifestyles in people with mental illness. The
importance of psychoeducational interventions as a means of weight management has also been supported by literature (Littrell et al., 2003; Loh et al., 2006; Menza et al., 2004; Wu et al., 2008). More importantly, the use of structured patient education using verbal, written and discussion methods as implemented in this intervention has been found to be successful in the targeted population (Fernandez et al., 2006).

Results from this project indicate that the participants who completed the psychoeducational intervention had significant improvement in their intake of fruits and vegetables over the eight week time period of the study. Additionally, participants also had a significant improvement in the amount of time that they were engaged in physical activity over the eight week time period of the study. The results of the project indicate that psychoeducational interventions can have an impact on nutrition and physical activity and health promoting behaviors in this patient population and can be successfully implemented over an eight week period. These findings are consistent with the current literature review. The results from the project demonstrate the value of promoting an evidence-based intervention to improve health outcomes in patients with severe mental illness who have increased cardiometabolic risk factors.

A total of 12 participants out of the 19 participants who completed the intervention also had a decrease in weight and BMI. The overall total weight loss by the group who participated in the intervention was 31 pounds, however the change was not statistically significant. Despite the lack of significant change in weight and BMI, the change in weight for the successful individuals further improves their health outcomes and begins to reduce their individual cardiometabolic risks. The eight week
psychoeducational intervention did not show statistically significant changes in participants’ blood pressure, pulse, waist, and waist/hip ratio. However there was a statistically significant decrease in the hip size of the participants. The lack of effect on physiological outcomes calls for further study. For example, studies with a longer duration would be beneficial to see if these parameters would change. Overall, the psychoeducation seems to be a promising intervention that may help modify risk factors including obesity, poor nutrition and the lack of physical activity that is prevalent in the targeted patient population. However, follow-up of participants would be beneficial to determine whether the benefits are sustainable after the eight week intervention period.

The total score on the 52 item scale Health-Promoting Lifestyle Profile II questionnaire showed significant improvement after the intervention, indicating that the intervention had an impact on the participants’ behavior associated with health promoting lifestyles. There was improvement in the spiritual growth subscale indicating that the psychoeducation intervention was effective in employing strategies that allowed participants to share thoughts and feelings through verbal and nonverbal messages that pertained to their health promoting goals and behaviors. The intervention allowed participants to be more goal oriented, more exposed to new experiences and be more aware of what was important in their lives as the scale items suggest. Key strategies of the intervention that were used included participants completing multiple choice questions and verbalizing the benefits of eating fruits and vegetables. Participants also wrote down and verbalized their barriers and solutions to increasing fruit and vegetable intake, and physical activity. Another activity offered was participation in a word game.
and coloring activity. More importantly, participants were able to formulate, write down and verbalize their project goals at every session.

There was also improvement on the physical activity scale. This agrees with the findings of the study that the participants improved their engagement in regular participation in light, moderate and vigorous activity over the eight week study period.

Other findings in the study indicated that the participants were faced with many barriers that affected their project goals. Health problems, financial difficulties, transportation, lack of fruit and vegetables, safety issues, and lack of motivation were common. Despite the challenges, these participants with mental illness were engaged in mutual goal setting and problem solving that made several participants successful in overcoming some of their barriers. In light of the findings of the challenges faced by this population, the overall implication is that policy makers and the administrators of the mental health agency need to pay attention to these barriers when it comes to future program planning.

The completion rate of 19 participants out of the original 23 participants, is also a key finding. This is an indication that individuals with severe mental illness can be engaged and participate successfully in an intervention. Four participants did not complete the intervention. One indicated that she was no longer interested in the intervention. Two male participants did not provide a reason for dropping out. Another male participant who dropped out indicated that he had problems with transportation.
Community Mental Health Clinic Environment and Interprofessional Team

It was imperative to assess the project site in order to understand current efforts related to health, nutrition and exercise teaching. The project site is designated as a Community Case Management site. The Community Case Management is one of the divisions of a larger mental health organization in a mid-western city in the United States. Community Case Management is one of the providers for the community behavioral health authority in the county where it is located. The clients who are served by the Community Case Management are referred from the community behavioral health authority after eligibility for Case Management services has been determined.

The Community Case Management agency is a medically necessary service designed to assist individuals who have a serious mental illness or co-occurring disorder (mental health, medical health, or substance use) to develop and implement strategies for obtaining strength-based and individualized services and supports. These are identified through a person-centered planning process.

The case managers at Community Case Management assist the clients in applying for benefits such as social security and government assistance such as Medicaid. Clients also receive assistance in finding resources like housing and access to substance abuse recovery programs. Mental health clients receive medical services from an onsite integrated medical clinic. The staffing of the integrated clinic consists of one onsite psychiatrist, one telepsychiatrist, and a psychiatric nurse practitioner. The clinic employs three registered nurses; one is full time while two are part time.
Efforts to Address Chronic Conditions at the Project Site

The project site has identified physical health and wellness as a desired goal for the clients it serves. The site provides wellness groups that are conducted by case managers to emphasize preventive care and management of chronic health conditions. These wellness groups could focus more regularly on diet and physical activity. In order to address wellness needs for the population, the project study location uses enhanced primary care coordination services. Clients with cardiovascular diseases, asthma, COPD, obesity and diabetes are referred to primary care services to ensure a continuum of care.

Role of Case Managers in Addressing Chronic Conditions

There are a total of about ten case managers who are both Bachelors and Master’s level social work clinical staff. The screening for enhanced service starts with the initial psychosocial assessment that is completed by the case workers during admission. The coordination of primary care is provided to all Case Management clients. The role of the case managers in terms of health promotion is to screen for co-morbid conditions. The case managers also assist the clients in becoming established with a primary care physician. Additionally, they coordinate information between Community Case Management and primary care offices. They are required by organizational policy to set a minimum of one goal addressing general health/wellness with the client. The site has a list of health clinics, which was created by a registered nurse, where the case managers can refer the clients. The clients are referred to clinics that provide care to uninsured patients or charge a flat rate. The clients can also be referred to medical clinics that offer
financial assistance to qualifying patients. The case managers are required to document contacts with the primary care providers in case files.

The role of the case managers is to coordinate the services of the clients. Since they see the clients more frequently than the medical staff, their role in health promotion is crucial. The case workers should be well trained and provided with adequate resources in order to play a key role in the health promotion of the clients. However, because the case managers do not have a medical background it is necessary for the organization to establish workshops and health education resources that will enhance their knowledge and skills.

**Role of Registered Nurses in Addressing Chronic Conditions**

The registered nurses (RNs) are based in the Integrated Medical Clinic. They are responsible for the patient assistance program. They provide support to the psychiatrist when clients have appointments for a psychiatric visit. They also provide triage services by being available for questions. Additionally, RNs review labs and facilitate follow up with the psychiatrists or primary care physician as appropriate. They are responsible for obtaining vital signs and reporting to the psychiatrist during office visits. The RNs are responsible for performing nursing assessments. They provide health education in telephone or face-to-face encounters during appointments or walk-ins. Additionally, they maintain contact with the primary care doctor to coordinate treatment plans. The RNs are also available for case consultation with the case managers.

The Psychiatric Nurse Practitioner is responsible for management of clients during their visit to the Integrated Medical Clinic. Additional duties include ordering
labs related to psychiatric medications or conditions. The Psychiatric Nurse Practitioner is also responsible for recommending clients who need referrals to primary care. The Psychiatric Nurse Practitioner could expand the role by implementing standards of care for managing metabolic syndrome and diabetes associated with psychiatric medications.

While the current role of the RNs focuses on the management of mental health conditions, expanding the role to screening for comorbid conditions would be more beneficial to the organization’s clients. In an expanded role, the RNs could provide information and support for areas of health, nutrition, and exercise. They are well prepared for this role and possess the required skills. The RNs and the Psychiatric Nurse Practitioner are able to use models like the Health Promotion Model (HPM) to entrench a health promotion initiative in the organization. The use of a manualized psychoeducational intervention for diet and physical activity could be easily implemented.

**Role of Peer Support Specialist in Addressing Chronic Conditions**

The peer support specialists help consumers with their identified self-management strategies. Additional duties include assisting the consumer with decision making and community linkages. The peer support specialist is responsible for supporting self-management approaches, therefore, another key role could include health, nutrition and exercise teaching in conjunction with the health care providers.

**Role of the Psychiatrist**

The psychiatrist role is to diagnose and treat mental illness, including addiction and substance use. The psychiatrist also refers patients appropriately to primary care
physicians and other specialists as deemed appropriate. At the project site, pharmacological management for overweight and obesity is not a common practice. However, reviewing and changing medications in the case that a client is gaining weight from an antipsychotic medication are common interventions. The integration of the psychoeducation intervention would therefore be beneficial as a means of managing clients who are at risk for overweight and obesity. The psychiatrist could also support the implementation of standards of care related to metabolic syndrome and diabetes associated with psychiatric medications.

**Integrating the Intervention at the Study Site**

It is important to understand the possibility of successfully integrating the intervention at the project site. The facilitator could offer the organization a plan that addresses the barriers and facilitators that were identified during the intervention. The facilitator could also suggest next steps to implementation which may include (a) staff training, (b) use of the psychoeducational manual, and (c) the possibility of entrenching the intervention in the electronic health record or intranet of the institution as an educational module for case managers, RNs, peer support specialists and as a tool to educate the clients in the form of a presentation, such as Power Point.

The inexpensive nature of the intervention may make it attractive for the mental health agency. The implementation of this intervention was supported by a grant from Kirkhof College of Nursing, Vulnerable Population Center of Distinction. Table 15 represents the expended funds for supplies for the psychoeducation intervention. In addition to the money spent, the time spent by the facilitator to meet with the participants
should be considered. Each participant who completed the intervention met with the facilitator for four, 45 minutes sessions during the 8 week period. Obviously, the per patient time would increase as on-going support beyond eight weeks is included. Once started, this support could be in the form of individual or group support or both, depending on efficiency needs and what is required to sustain individual outcomes.

Table 15

*Project Costs*

<table>
<thead>
<tr>
<th>Item</th>
<th>Price/Unit</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 measuring cups</td>
<td>$2.97</td>
<td>$78.71</td>
</tr>
<tr>
<td>25 canvas tote bags</td>
<td>$1.99</td>
<td>$52.73</td>
</tr>
<tr>
<td>25 placemats</td>
<td>$5.00</td>
<td>$125.00</td>
</tr>
<tr>
<td>2 bags of Apples</td>
<td>$4.00</td>
<td>$8.00</td>
</tr>
<tr>
<td>12 packets, mixed vegetables</td>
<td>$2.00</td>
<td>$24.00</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td></td>
<td><strong>$288.44</strong></td>
</tr>
</tbody>
</table>

**Usefulness of Health Promotion Model and Chronic Care Model**

These models served to facilitate a collaborative interaction between the facilitator and the participants. The HPM also provided the facilitator a conceptual framework for the delivery of the intervention. Furthermore the model was useful in providing a framework to assess the health-promoting behavior of participants prior to
and after the psychoeducational intervention. Health promotion is the foundation of prevention and management of chronic illness. Since the goal of this project was to assist the participants to change their behaviors and achieve desired improvement of their health risks by maintaining healthy lifestyle behaviors, the HPM supported the design and the delivery of the psychoeducation intervention. Additionally, the HPM was the appropriate model to explain the results of the psychoeducation intervention. While physiologic measures failed to show significant change (except for hip size), the goal setting process resulted in a significant change of health behaviors.

The CCM provided a conceptual framework to explore the complexities of implementing a psychoeducational intervention project in a Community Mental Health Clinic that provides care to clients with chronic mental illness. The success of the delivery of the psychoeducation intervention was supported by the CCM model. The CCM model could be used as a framework to sustain this type of program in the future for this organization. The CCM model supports the use of evidence-based practice through a collaborative approach to care delivery that includes collaboration with the client and an interdisciplinary team. The CCM provided a framework to the facilitator to identify resources to enhance the implementation of the intervention. The CCM further enhanced the formation of a partnership with participants during the implementation of the intervention. More importantly, the CCM facilitated the assessment of the organization with the goal of developing a plan for successful project implementation and future sustainability. The CCM further supported the key principle of chronic disease management. The need to complement an engaged and committed patient with an
informed care team is fundamental to effectively manage obesity and associated cardiometabolic risk factors. The organization can use the CCM to plan and implement a similar program for their clients by supporting the use of evidence-based education interventions when providing client education. Training of the registered nurses (RNs) who have the required health knowledge to offer the psychoeducation program while having the case managers offer supported follow up to the clientele is one feasible way of implementing and sustaining the intervention.

**Strengths of the Project**

This study has several strengths. One strength is that it was theory driven. Moran, Burson, and Conrad (2014) propose that the intervention in the scholarly project should be directed by the theoretical framework. In this project the Health Promotion Model and Chronic Care Model were used as the theoretical frameworks. More importantly, this study provided a great opportunity for interdisciplinary collaboration in the community mental health clinic setting. Strength for the intervention is further derived from multiple clinical guidelines that address the management of chronic illnesses in the United States of America. The simplicity and measurements of key outcomes is another strength of the intervention. Since the intervention was conducted by one facilitator there was consistency in the application of the intervention and outcomes measures. The participants in the project were also from diverse ethnic backgrounds and age groups. They were representative of the clientele served in the Case Management caseload. The intervention utilized various strategies including phone call reminders to retain study participants. The participants were provided with tools that reinforced the teaching of the
intervention like the measuring cup and placemats. The use of strategies like reviewing previous sessions also reinforced the educational content. The clients who participated were motivated to engage in the educational intervention. Finally, the grant received from Kirkhof College of Nursing, Vulnerable Population Center of Distinction, was a validation of the importance of addressing health outcomes of patients with severe mental illness.

**Limitations of the Project**

The limitations of the current project include the small sample size (n=19) and convenience sample of participants. This affects its generalizability. Despite this, it does provide some support for the use of this type of intervention in this type of setting. In addition, with the relatively short implementation period, it is impossible to determine whether the benefits would be improved and sustained over a longer time. The self-report approach in obtaining data for the Health-Promoting Lifestyle Profile II questionnaire, reported fruit intake, vegetable intake, and physical activity level was a threat regarding the accuracy of the data. Polit and Beck (2008) indicate that self-report questionnaires are subject to possible threats, for example response bias or social desirability. Reliability related to standardized procedures for obtaining biological measurements is also a study limitation.

**Implications for Future Intervention Implementation**

The current project utilized a small sample size. Future recommendations include using a larger sample. The time frame for the study was also short and included only four sessions. In designing a future study, a longer time frame and more sessions would be
important. There was no opportunity for a longer period of follow-up after the intervention. Future projects or actual interventions should incorporate long term follow-up for participants to ascertain whether the benefits are sustained. Barriers and challenges that face patients with mental illness should be considered and addressed while conducting similar interventions. Clients with severe mental illness can be engaged with supported follow up which in turn may lead to their being successful in achieving goals for healthy nutrition and engaging in physical activity.

Whether this type of intervention is studied further or implemented in a site such as the Case Managements agency, several conclusions are evident from this project. Clients are capable of identifying health related goals that can be successfully obtained with appropriate education, facilitation, and support. The success of this brief intervention suggests benefits for a longer-term intervention. The roles of the interdisciplinary team can be broadened to support evidence-based interventions and standards of care for this at-risk population. Finally, the role of the DNP prepared nurse could be vital to implementing and sustaining system changes that enhance the lives of this vulnerable population. The overall implication is the need to implement and document the outcomes of nurse-led interprofessional practice teams to patient outcomes.

**Barriers and Facilitators of Integrating the Intervention**

Apparent barriers to the integration of the proposed intervention include staff, time, knowledge and cost. The staff may be resistant to change what is needed to entrench the proposed intervention. Lack of time for additional duties may be a potential barrier to the staff employed by the organization. Some staff including Case Managers
may cite lack of knowledge and skills to implement the proposed interventions. To the organization, the integration of the proposed intervention may require some restructuring of the staff duties or addition of staff members including an RN. The organization may consider this as time consuming and costly.

The organization and all staff members can be effective as facilitators of the proposed intervention. The organization can be a key facilitator of the integration of the proposed intervention. With the passage of the Affordable Care Act (ACA) it is necessary for the organization to transform the health care delivery system for improved patient outcomes in the management of chronic conditions. Currently the organization has a Behavioral Health Care Pilot program whereby clients are screened and assessed to determine if they have higher primary care at-risk conditions to facilitate enhanced primary care coordination services. Furthermore provision of comprehensive coordinated care improves patient outcomes and decreases health care costs.

RNs in the organization are well trained in health promotion and client education and can facilitate the integration of the proposed intervention after receiving the necessary training. They can also collaborate with the case managers by providing in-services to educate the case managers on the implementation of the intervention. The lead case manager can be educated on the intervention and be responsible for educating new case managers on how to implement the intervention. All case managers need to be facilitators in the integration of the intervention since they are responsible for providing health and wellness education to the clients and for identifying one physical health related goal. They can facilitate the integration of the proposed intervention by
recommending it as a resource that would be beneficial in their daily role. The Psychiatrists and Psychiatric Nurse Practitioner who are the key health care providers can facilitate the implementation of the intervention by recommending that patients who are overweight or obese or who are receiving psychiatric medications that carry these risks be referred for the nutrition and physical activity education by the Case Managers, RNs and Peer Support Specialist using the proposed intervention. In conclusion, the presence of an interprofessional team, with various levels of expertise within this organization provides it with a great ability to entrench the psychoeducation intervention.

**Doctor of Nursing Practice (DNP) Roles**

Several significant roles associated with the Doctor of Nursing Practice (DNP) degree were exemplified by the facilitator of this project. With the introduction of the Doctor of Nursing Practice (DNP) degree, the DNP prepared clinician should be prepared to contribute significantly to the practice environment by engaging in translation of evidence-based practice. Furthermore, DNP prepared clinicians are focused on clinical practice at the highest standard level of practice (American Association of Colleges of Nursing [AACN], 2004). According to the AACN, one role of the DNP prepared advance practice nurse is to become an innovative leader in the transformation of the current health care system. Furthermore, Moran et al. (2014) indicate that work that is done in relation to improving patients and healthcare systems is increasingly viewed as important in contributing to knowledge that can be amassed and shared to produce further improvements. The Essentials of DNP education (AACN, 2006) identify enhancements to the advanced practice nurse’s knowledge and skill set. Additionally, Moran et al.
support the identification of the specific essentials that are demonstrated in the project to confirm evidence of doctoral-level work.

Essential I is the Scientific Underpinnings for Practice which was demonstrated in this project. The facilitator integrated nursing science with information from the mental health organization. To improve participants’ outcomes, the psychoeducation intervention was supported by nursing theory, a theory from a different discipline, and from published literature.

Essential II, which is Organizational and Systems Leadership for Quality Improvement and Systems Thinking, was also demonstrated. According to AACN (2006), DNP graduates should display expertise in assessing organizations, identifying system issues, and facilitating organization wide changes in practice delivery. While developing and implementing this intervention, the investigator was interested in approaches that met the current and future needs of the target patient population and the organization that served them.

The investigator also demonstrated Essential III, which is Clinical Scholarship and Analytical Methods for Evidence-Based Practice. Existing literature was evaluated to support the intervention. Additionally, the intervention involved systematic evaluation of outcomes of the participants in the mental health agency.

Another essential that was addressed in the intervention was Essential IV, Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care. Supertracker, an online tool, was selected and utilized during the intervention to recommend fruit and vegetable intake among participants.
Data management and incorporating agency requirements for the use of electronic health records and confidential personal information also used information technology.

Essential V is Health Care Policy for Advocacy in Health Care. Providing an intervention that was based on scientific knowledge to a target population that could benefit was part of this project. It is important to provide quality care that is responsive to vulnerable populations in order to ensure equity in improved health outcomes.

Interprofessional Collaboration for Improving Patient and Population Health Outcomes, Essential VI, was also part of this project. The investigator collaborated with other members of the organization including the team leader and case managers to enhance the success of the intervention. The investigator analyzed how organizational and professional roles might be redesigned to implement this type of intervention in the future.

Essential VII is Clinical Prevention and Population Health for Improving the Nation’s Health and is also important for the DNP graduates. While implementing this intervention the investigator participated in health promotion and risk reduction activity. Additionally, the evaluation and interpretation of the current project data may influence methods that can improve our nation’s health.

Finally, Essential VIII is the Advanced Nursing Practice which was clearly demonstrated by the investigator. While implementing this intervention the investigator incorporated a psychoeducation approach which is supported by the literature in managing lifestyle and medications in the target population. The investigator formed partnerships with participants as well as agency staff with the goal of improving patient
outcomes. The process also involved the development of clinical decision making skills and critical thinking. Evaluation of evidence-based care was also an advance nursing practice competency that was utilized while developing the intervention.

**Conclusion**

Clients with severe mental illness have increased cardiometabolic risk factors. Individual lifestyle choices that include unhealthy diet and inactivity are prevalent in this population. Psychotropic medications also have an impact on physical health problems of patients with severe mental illness. DNP prepared clinicians can be at the forefront of implementing interventions that decrease risk factors by engaging patients in psychoeducational interventions. Changing behaviors or maintaining healthy lifestyles is difficult for patients with severe mental illness. The outcome of this intervention revealed how a DNP educated clinician may implement an intervention to effectively educate patients with severe mental illness on the need to modify their increased cardiometabolic risk. Additionally, providing clients with simple tools that might contribute to success like measuring cups or placemats that reinforce educational content, is another valuable consideration. Individual goal setting and supported follow-up utilized by the facilitator while conducting the intervention would be worthwhile to consider for this and similar agencies serving this clientele.

Finally, the organization can consider this project as one feasible way of implementing a psychoeducation intervention. Using the CCM model to develop training of the registered nurses (RNs) who have the required health knowledge to offer the psychoeducation program and the case managers to offer supported follow up to the
clients is a feasible way of implementing and sustaining this type of intervention. The feasibility of this intervention can be further enhanced by incorporating modules in the EHR, using existing online programs like SuperTracker, and creating a standardized workbook for implementation. The CCM model and the AACN Essentials for DNP education support the full engagement of clients with a multi-disciplinary team to achieve sound health care goals.
APPENDICES
Appendix A

Health Promotion Model Copyright Permission
Dear Alice:

You have my permission to use the Health Promotion Model in your work and to reprint a diagram of the Health Promotion Model in your proposal and written dissertation. I wish you success with your academic work.

To Your Health,

Nola Pender
Mar 21, 2014

Alice O. Mwanda, MSN, RN, FNP
Grand Valley State University
1 Campus Drive
Allendale, MI 49401-9403

Dear Ms. Mwanda:

You have our permission to include content from our text, *HEALTH PROMOTION IN NURSING PRACTICE, 5th Ed. by PENDER, NOLA J.; MURDAUGH, CAROLYN L.; PARSONS, MARY ANN*, in your doctoral dissertation from GRAND VALLEY STATE UNIVERSITY.

Content to have print copies and to be published in PDF format on Grand Valley State University's ScholarWorks web site:

- Page 50 Figure 2-4 Health Promotion Model

Please credit our material as follows:


Sincerely,

Cheryl Freeman, Permissions Administrator
Appendix B

Chronic Care Model
Figure 2. Chronic Care Model. Reprinted from "Chronic Disease Management: What Will It Take to Improve Care for Chronic Illness?" E. H Wagner, 1998, Effective Clinical Practice, 1998, Vol1, Reprinted with permission from American College of Physicians (See Appendix P).
Appendix C

Grand Valley State University Human Research Review Committee (HRRC) Approval
DATE: March 10, 2014

TO: ALICE MWAANDA, MSN, FNP, RN
FROM: Grand Valley State University Human Research Review Committee
STUDY TITLE: [538704-3] THE EFFECTIVENESS OF A PSYCHOEDUCATIONAL INTERVENTION ON HEALTH PROMOTING BEHAVIORS AND PHYSICAL HEALTH OF ADULT PATIENTS (18 and OVER) ON ANTIPSYCHOTIC MEDICATIONS
REFERENCE #: 14-113-H
SUBMISSION TYPE: Revision
ACTION: APPROVED
APPROVAL DATE: March 10, 2014
APPROVAL EXPIRATION: March 10, 2015
REVIEW TYPE: Expedited Review

Thank you for your submission of materials for this research study. The Human Research Review Committee has approved your research plan application as compliant with all applicable sections of the federal regulations, Michigan law, GVU policies and HRRC procedures. All research must be conducted in accordance with this approved submission.

Please insert the following sentence into your information/consent documents as appropriate. All project materials produced for participants or the public must contain this information.

This research protocol has been approved by the Human Research Review Committee at Grand Valley State University. File No. 14-113-H Expiration: March 10, 2015.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require that each participant receive a copy of the signed consent document.

This approval is based on the HRRC determination that no greater than minimal risk is posed to research participants. This study has received expedited review, 45 CFR 46.110 category 4, based on the Office of Human Research Protections 1998 Guidance on Expedited Review Categories.

Please note the following in order to comply with federal regulations and HRRC policy:

1. Any change to previously approved materials must be approved by this office prior to initiation.
   Please use the Change in Approved Protocol form for this submission. This includes, but is not limited to, changes in key personnel, study location, participant selection process, etc.
   See HRRC policy 1010, Modifications to approved protocols.
2. All UNANTICIPATED PROBLEMS and SERIOUS ADVERSE EVENTS to participants or other parties affected by the research must be reported to this office within 7 days of the event occurrence, using the UP/SAE Report form. If the adverse event includes a fatality, hospitalization, or security breach of sensitive information immediately notify the Human Research Review Committee Chair, Dr. Paul J. Reitermeier, 331-3417 AND Human Research Protections Administrator, Mr. Jon Jellema, in the Office of the Provost, 331-2400. See HRRC policy 1020, Unanticipated problems and adverse events.

3. All instances of non-compliance or complaints regarding this study must be reported to this office in a timely manner. There are no specific forms for this report type. See HRRC policy 1030, Research non-compliance.

4. All required research records must be securely retained in either paper or electronic format for a minimum of 3 years following the closure of the approved study. This includes original or digitized copies of signed consent documents. Research studies subject to the privacy protections under HIPAA are required to maintain selected research records for a period of at least 6 years after the close of the study.

5. At least 60 days prior to current approval expiration, please submit a Continuing Review form:
   - Protocols that are active and open for enrollment require both the Primary Investigator and Authorizing Official to electronically sign the Continuing Review submission in IRBNet.
   - Protocols that are active for data analysis or long term follow-up ONLY require the Principal Investigator’s signature but do not need to be further authorized.
   - A copy of the informed consent/assent form currently in use in the study must accompany the submission unless the study has been closed to enrollment, and active only for data analysis, for more than 1 year.

If you have any questions, please contact the Research Protections Program, Monday through Thursday at (616) 331-3197 or rps@gvsu.edu. The office observes all university holidays, and does not process applications during exam week or between academic terms. Please include your study title and reference number in all correspondence with our office.
Appendix D

Pine Rest Christian Mental Health Services Approval
December 12, 2013

Andrea Bostrom, PhD
Associate Professor and Dissertation Chairperson
Grand Valley State University - Kirkhof College of Nursing
301 Michigan St. NE
Grand Rapids, MI 49503-3314

RE: Alice Mwanda, Nurse Practitioner, Doctoral Candidate

Dear Dr. Bostrom:

This letter is to confirm that Pine Rest Christian Mental Health Services has given approval to Alice Mwanda to conduct her research project titled “The Effectiveness of a Psychosocial Intervention on Health Promoting Behaviors and Physical Health of Adult Patients (18 and Over) on Antipsychotic Medication” with patients served at the Pine Rest Community and Case Management Clinic.

This project has been reviewed and approved by Al Jansen, Director of Community and Residential Services, the Pine Rest Research Steering Committee and Alan Armstrong, Chief Medical Officer. Ms. Mwanda will work under the direct supervision of Jeffrey Madigan, team leader for the Community and Case Management Clinic.

We look forward to working with Ms. Mwanda on her project. If you have any questions, please contact our Research Program at (616) 222-4592.

Best regards,

[Signature]

Alan Armstrong, MD
Chief Medical Officer
Appendix E

Recruitment Script for Case Managers
RECRUITMENT SCRIPT

February 25, 2014

Dear ____________________,

During the Winter/Spring 2014, you will have the chance to be part of a special project led by a Family Nurse Practitioner, who is a Doctor of Nursing Practice (DNP) intern.

The aim of the project is to improve your health promoting lifestyle and have a positive effect on your physical health including weight, BMI, blood pressure and waist circumference. If you choose to be part of this project you will be able to meet with the project leader for four 45 minutes individualized sessions (visit).

Whatever you share with the project leader as part of participating in this project, will not be shared outside the Clinic in any way that connects the information to you. If you have any concerns or questions about being part of this project, the project leader will be happy to speak with you.

Thank you!

Alice Mwanda, MSN, FNP, RN
Doctor of Nursing Practice Intern and Project Leader
Appendix F

Informed Consent for Participants
CONSENT TO TAKE PART IN A PROJECT AND AUTHORIZATION TO DISCLOSE HEALTH INFORMATION

Project Title: The Effectiveness of a Psychoeducational Intervention on Health Promoting Behaviors and Physical Health of Adult Patients (18 and over) on Antipsychotic Medications

Principal Investigator(s): Alice O. Mwanda, MSN, FNP, RN
Doctor of Nursing Practice Student
Cook DeVos Center for Health Sciences, Kirkhof College of Nursing, Grand Valley State University
301 Michigan St. NE, Grand Rapids, MI 49503-3314,
Phone (269) 532 9288

Andrea Bostrom, Ph.D., PMHCNS-BC,
Professor of Nursing and Dissertation Chair
Cook DeVos Center for Health Sciences, Kirkhof College of Nursing, Grand Valley State University
301 Michigan St. NE, Grand Rapids, MI 49503-3314,
Phone (616) 331 7172

Jeffrey Madigan, MA, LPC
Team Lead, Case Management Services
Pine Rest Christian Mental Health Services
300 68th ST. SE, Grand Rapids, MI 49501
Phone (616) 281-6363 ext. 2902

Project Location: Community Case Management Services
Pine Rest Christian Mental Health Services
300 68th St. SE,
Grand Rapids, MI 49501

You are being asked to participate in a project study. In order to decide whether or not you should agree to be part of this project, you should receive enough information about its procedures, risks and benefits to make a judgment. This process is called informed consent. This consent form gives detailed information about the project. Your participation is totally voluntary. If you wish to participate in this project you will be asked to sign this form.
Description of the project

The purpose of this project is to learn more about the effectiveness of a psychoeducational intervention on health promoting behaviors and physical health among persons on antipsychotic medications. You were referred for the project by your case manager. To participate, you must be at least 18 years old and taking at least taking one antipsychotic medication.

Project Procedures

If you decide to take part in this project,

1. You will be asked to attend four sessions (visits), lasting 45 minutes over eight weeks.
2. Your medical record will also be reviewed to obtain information on your mental health diagnosis and names and doses of your prescribed medications.
3. During your first meeting or the informational session with the project leader, you will be asked to provide information about your gender, ethnicity and age. The project leader will obtain measurements of your weight, height, blood pressure, pulse, waist and hip size. She will also calculate your BMI and waist/hip ratio. The project leader will also ask you to complete a 52 item questionnaire on your health promoting lifestyle that will take about 20 to 30 minutes during the first and the last session.
4. During the four sessions, the project leader will facilitate an individualized educational intervention as well as provide you with supported follow-up with the aim of establishing your goals for diet and exercise. Additionally the intervention is aimed at assisting you improve your physical health and reduce your weight. The sessions in the intervention will stress the importance of improving fruit and vegetable consumption and physical activity. The sessions have been designed to motivate and build your skills using simple tools that will assist you to achieve your nutrition and physical activity goals.
5. During the second, third and fourth sessions, measurements of your weight, height, blood pressure, pulse, waist and hip size will be obtained again. The leader will also calculate your BMI and waist/hip ratio again. This information will be shared with you in writing and with your case manager with your permission.
6. In order to protect your right to have your personal information kept private, whatever you share with the project leader will not be shared outside of the Clinic in any way that connects the information to you. The data collection documents will be coded to keep them together during the project. At the completion of the project the code list will be destroyed.
7. Your protected health information (PHI) will not be taken off site. A hard copy “source” documents (data collection tools) will be kept in a locked file at Pine Rest Case Management. Electronic data will be securely stored in Sharepoint after being entered from the hard copy source documents into a spreadsheet - this data will be de-identified. Your de-identified data will be downloaded onto a
password protected USB prior to being taken to GVSU. A separate master list linking your name to your assigned study ID will also be kept. Electronic copies of approved protocol, informed consent and data collection tools will also be kept in share point.

8. The facilitator of the project will not be given full access to your chart. Jeffrey Madigan can pull the data needed for the project (psychiatric diagnosis and medication information) or the facilitator will only be granted access to this information.

9. Alice O. Mwanda will obtain the informed consent, Jeffrey Madigan will come in immediately afterwards to answer questions/concerns you may have and to confirm your understanding and then sign off on the informed consent. As a participant, you will receive a copy of the signed informed consent.

**Voluntary Participation and Withdrawal**

Participation in the project is completely voluntary and you may withdraw anytime without penalty. Before agreeing to participate, you may discuss it with someone who is not associated with this project. If you decide to take part in the project and later change your mind, you may withdraw or discontinue participation at any time, as well.

Whatever you decide, you will not be penalized or lose any benefits to which you are otherwise entitled nor will your decision have any effect on your current or future relationship with Pine Rest or affiliated health care provider. Formal withdrawal of your consent to participation in this project can be done by notifying Alice O. Mwanda, Dr. Andrea Bostrom or Jeff Madigan. Their contact information is located on the first page of this informed consent document.

The project staff can also withdraw you from the project without your consent, if needed. The following are some examples why this would happen:

1. You are unable to comply with or complete the project procedures within the outlined project schedule.
2. Project staff decides that participation is not in your best interest.
3. The project is stopped.

Any project information or data recorded resulting from your participation in this project prior to the time of withdrawal may continue to be used and disclosed by the project staff for the project purposes described.

**Risks or Discomforts of this Project**

There may be some minimal risk or discomfort to you as a project participant:

1. You may feel inconvenienced by the questionnaires or distressed by being asked questions that may be uncomfortable for you. You are encouraged to speak with
your treatment team about any discomfort, anxiousness or distress you may experience. Remember, you may take a break at any time or even stop project participation, if needed.

2. There is a risk of a breach of confidentiality (privacy), although there are many safeguards in place to prevent this which are explained later in this consent document. To minimize this risk data will be coded during the project. At the completion of the project the code list will be destroyed.

Benefits of this Project

Participation in this project may be a benefit to your health promoting behaviors including dietary and physical activity habits. The participation may also lead to an improvement of your physical health. Because this is an evidence-based research translation project the outcomes for individual participants cannot be predicted in advance. There may be no benefit to you from participating.

Alternative Procedures

If you do not want to be part of the project, you may choose not to participate and will continue to receive the same treatment in the agency.

Costs and Compensation for Project Participation

Neither you nor any third party insurance provider will be billed for project-related procedures. No monetary compensation will be given to you for your participation.

Confidentiality and Access to Identifiable Information

Although we cannot guarantee absolute confidentiality and privacy, any information about you obtained from this project will be kept as private as possible to the maximum extent required by law. However, during your participation, if you indicate risk of possible harm to yourself or others, your doctor and/or clinician will be notified.

In order to keep your health information private, you will be assigned a project number that will be used instead of your name to code project documents pertaining to your participation in the project. The data collected and analyzed will be indicated by this project number only. A master key linking your name to your project code will be maintained separately from your project file in a secure location. Your project file will be stored in a locked file cabinet. Only authorized project personnel will have access to these records. The investigators may continue to use, for the purposes described above, identifiable information related to your participation for the duration of the project.

You have the right to see and get a copy of your project records for as long as the investigator has this information; however, you might not be able to review or receive some of the records until after the project has been completed.
Project related monitoring, audits and inspections by members of the Grand Valley State University Human Research Review Committee and other regulatory authorities will be permitted as required. Additionally, the investigators may be required to release identifiable information from your project record in response to an order from a court of law.

For data analysis purposes, all project data collected will be sent in a secure manner to the Grand Valley State University project staff in Grand Rapids, MI using an encrypted USB drive. Data sent to Grand Valley State University will only be identified by your unique project number and will not contain personal identifiers (e.g., name, address, social security number). If information from this project is published or presented at scientific meetings, your name and other personal information will not be used.

Questions and Concerns

If you have any questions or concerns about this project, please contact Alice O. Mwanda, Dr. Andrea Bostrom or Jeffrey Madigan. Their contact information is listed on the first page of this document.

If you have any questions or concerns about your rights as a participant in this project, please direct them to:

Human Research and Review Committee
Grand Valley State University
301C DeVos Center
401 Fulton Street
Grand Rapids, MI 49504 U.S.A
Phone: 616-331-3197
Email: hrrc@gvsu.edu

HIPAA Authorization

As part of this project, you are being asked to release your health information. The Health Insurance Portability and Accountability Act (HIPAA) permits a hospital or doctor’s office to use or release protected health information (PHI) for the purposes of treatment, payment or health care operations. A HIPAA authorization gives permission from you to use or release PHI for project purposes, and is in addition to your consent to participate in this project.

In working with the sponsor, the investigator, Alice O. Mwanda, will use and share personal health information about you. This is information about your health that may also include your name, address, telephone number or other facts that could identify the health information as yours. This includes information in your medical record and information created or collected during the project. This information may include your medical history, physical exam and laboratory test results. Some of these tests may have been done as part of your regular care. The investigator will use this information about you to complete this project.
In most cases, the investigator will use your initials and assign a code number to your information that is shared with the sponsor. The sponsor and its representative may review or copy your personal health information at the project site. Regulatory authorities and the Grand Valley State University Human Research Review Committee, Pine Rest Christian Mental Health Research Committee Institutional Review Board may also review or copy your information to make sure that the project is done properly or for other purposes required by law.

By signing this Authorization, you allow the investigator to use your personal health information to carry out and evaluate this project. You also allow the investigator to share your personal health information with:

- the sponsor and its representatives
- Grand Valley State University Human Research Review Committee
- the U.S. Food and Drug Administration (FDA)
- Other regulatory agencies - e.g. National Institutes of Health (NIH), Department of Health and Human Services (DHHS)

Your personal health information may be further shared by the groups above. If shared by them, the information will no longer be covered by the Privacy Rule. However, these groups are committed to keeping your personal health confidential.

You have the right to see and get a copy of your records related to the study for as long as the investigator has this information. However, by signing this Authorization you agree that you might not be able to review or receive some of your records related to the project until after the project has been completed.

You may choose to withdraw this Authorization at any time, but you must notify the investigator verbally or in writing. Notify Alice O. Mwanda of your wish to withdraw by contacting Alice O. Mwanda at Cook DeVos Center for Health Sciences, Kirkhof College of Nursing, 301 Michigan St. NE, Grand Rapids, MI 49503-3314 or 269 532 9288. Or you may contact Dr. Andrea Bostrom at Cook DeVos Center for Health Sciences, Kirkhof College of Nursing, 301 Michigan St. NE, Grand Rapids, MI 49503-3314 or 616 331 7172. Or you may contact Jeffrey M. Madigan at 300 68th St. SE, Grand Rapids, MI or 616 222 4570. If you withdraw from the project and withdraw your Authorization, no new information will be collected for study purposes unless the information concerns an adverse event (a bad effect) related to the project. If an adverse event occurs, your entire medical records may be reviewed. All information that has already been collected for project purposes, and any new information about an adverse event to the project, will be sent to the project sponsor.
If you withdraw from the project but do not withdraw your Authorization, new personal health information may be collected until this project ends. This authorization expires on 12/31/2014.

If you do not sign this Authorization, you cannot participate in this project or receive project-related treatment. If you withdraw this Authorization in the future, you will no longer be able to participate in this project. Your decision to withdraw your Authorization or not to participate will not involve any penalty or loss of access to treatment or other benefits to which you are entitled.

**DOCUMENTATION OF INFORMED CONSENT**

By signing this consent form and HIPAA authorization and by initialing each page, I certify I have read this form, I have had the opportunity to ask questions about this project and this form, and I have received answers that fully satisfy those questions. I am voluntarily signing this consent form and HIPAA authorization as evidence of my decision to participate in this project and I am giving authorization for release of all my protected health information relative to project.

I am aware I may withdraw my consent and HIPAA authorization in writing or verbally at any time without harming my future medical care or losing any benefits to which I might be otherwise entitled. I have been advised that the investigator in charge of this project may discontinue my participation in this project if it is felt to be in my best interest, if I do not follow the project requirements, or if the project is stopped.

I will receive a signed copy of this Project Informed Consent Form and HIPAA Authorization.

By signing this consent form, I have not waived any of my legal rights or released the parties involved in this project from liability for negligence.

__________________________________________________________________________
Printed Name of Project Participant

__________________________________________________________________________
Signature of Project Participant Date Time

__________________________________________________________________________
Printed Name of Person Obtaining Consent

__________________________________________________________________________
Signature of Person Obtaining Consent Date Time
Appendix G

Participant Data Collection Sheet
### Participant Data Collection Sheet

<table>
<thead>
<tr>
<th>Code Number</th>
<th>Age</th>
<th>Ethnicity</th>
<th>Gender</th>
<th># of psych. Meds</th>
<th>Reported activity level:</th>
<th>List of psych. meds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sedentary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Moderately active</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>Recruitment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Height**
- **Weight**
- **Calculated BMI**
- **Waist Circumference**
- **Hip size**
- **Waist-Hip Ratio**
- **Blood Pressure**

<table>
<thead>
<tr>
<th>Reported daily intake of fruit</th>
<th>Reported daily intake of vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup</td>
<td>1 cup</td>
</tr>
<tr>
<td>2 cups</td>
<td>2 cup</td>
</tr>
<tr>
<td>3 cups</td>
<td>3 cups</td>
</tr>
<tr>
<td>4 cups</td>
<td>4 cups</td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
</tr>
</tbody>
</table>
Appendix H

Health-Promoting Lifestyle Profile II
LIFESTYLE PROFILE II

DIRECTIONS: This questionnaire contains statements about your present way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling:

N for never, S for sometimes, O for often, or R for routinely

1. Discuss my problems and concerns with people close to me. N S O R
2. Choose a diet low in fat, saturated fat, and cholesterol. N S O R
3. Report any unusual signs or symptoms to a physician or other health professional. N S O R
4. Follow a planned exercise program. N S O R
5. Get enough sleep. N S O R
6. Feel I am growing and changing in positive ways. N S O R
7. Praise other people easily for their achievements. N S O R
8. Limit use of sugars and food containing sugar (sweets). N S O R
9. Read or watch TV programs about improving health. N S O R
10. Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber). N S O R
11. Take some time for relaxation each day. N S O R
12. Believe that my life has purpose. N S O R
13. Maintain meaningful and fulfilling relationships with others. N S O R
14. Eat 6-11 servings of bread, cereal, rice and pasta each day. N S O R
15. Question health professionals in order to understand their instructions. N S O R
16. Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week). N S O R
17. Accept those things in my life which I can not change. N S O R
18. Look forward to the future. N S O R
19. Spend time with close friends. N S O R
20. Eat 2-4 servings of fruit each day. N S O R
22. Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling). N S O R
23. Concentrate on pleasant thoughts at bedtime. N S O R
24. Feel content and at peace with myself. N S O R
25. Find it easy to show concern, love and warmth to others. N S O R
26. Eat 3-5 servings of vegetables each day.  
27. Discuss my health concerns with health professionals.  
28. Do stretching exercises at least 3 times per week.  
29. Use specific methods to control my stress.  
30. Work toward long-term goals in my life.  
31. Touch and am touched by people I care about.  
32. Eat 2-3 servings of milk, yogurt or cheese each day.  
33. Inspect my body at least monthly for physical changes/danger signs.  
34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).  
35. Balance time between work and play.  
36. Find each day interesting and challenging.  
37. Find ways to meet my needs for intimacy.  
38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.  
39. Ask for information from health professionals about how to take good care of myself.  
40. Check my pulse rate when exercising.  
41. Practice relaxation or meditation for 15-20 minutes daily.  
42. Am aware of what is important to me in life.  
43. Get support from a network of caring people.  
44. Read labels to identify nutrients, fats, and sodium content in packaged food.  
45. Attend educational programs on personal health care.  
46. Reach my target heart rate when exercising.  
47. Pace myself to prevent tiredness.  
48. Feel connected with some force greater than myself.  
49. Settle conflicts with others through discussion and compromise.  
50. Eat breakfast.  
51. Seek guidance or counseling when necessary.  
52. Expose myself to new experiences and challenges.
HEALTH-PROMOTING LIFESTYLE PROFILE II

Scoring Instructions

Items are scored as
Never (N) = 1
Sometimes (S) = 2
Often (O) = 3
Routinely (R) = 4

A score for overall health-promoting lifestyle is obtained by calculating a mean of the individual's responses to all 52 items; six subscale scores are obtained similarly by calculating a mean of the responses to subscale items. The use of means rather than sums of scale items is recommended to retain the 1 to 4 metric of item responses and to allow meaningful comparisons of scores across subscales. The items included on each scale are as follows:

Health-Promoting Lifestyle 1 to 52
Health Responsibility 3, 9, 15, 21, 27, 33, 39, 45, 51
Physical Activity 4, 10, 16, 22, 28, 34, 40, 46
Nutrition 2, 8, 14, 20, 26, 32, 38, 44, 50
Spiritual Growth 6, 12, 18, 24, 30, 36, 42, 48, 52
Interpersonal Relations 1, 7, 13, 19, 25, 31, 37, 43, 49
Stress Management 5, 11, 17, 23, 29, 35, 41, 47

3/95: srw
Appendix I

Estimated Caloric Needs
### TABLE 2-3. Estimated Calorie Needs per Day by Age, Gender, and Physical Activity Level

Estimated amounts of calories needed to maintain calorie balance for various gender and age groups at three different levels of physical activity. The estimates are rounded to the nearest 200 calories. An individual’s calorie needs may be higher or lower than these average estimates.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age (years)</th>
<th>Sedentary</th>
<th>Moderately Active</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Child (female and male)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-3</td>
<td>1,000-1,200</td>
<td>1,000-1,400</td>
<td>1,000-1,400</td>
<td></td>
</tr>
<tr>
<td>4-8</td>
<td>1,200-1,400</td>
<td>1,400-1,600</td>
<td>1,400-1,800</td>
<td></td>
</tr>
<tr>
<td>9-13</td>
<td>1,400-1,600</td>
<td>1,600-2,000</td>
<td>1,800-2,200</td>
<td></td>
</tr>
<tr>
<td>14-18</td>
<td>1,900</td>
<td>2,000</td>
<td>2,400</td>
<td></td>
</tr>
<tr>
<td>19-30</td>
<td>1,800-2,000</td>
<td>2,000-2,200</td>
<td>2,400</td>
<td></td>
</tr>
<tr>
<td>31+</td>
<td>1,800</td>
<td>2,000</td>
<td>2,300</td>
<td></td>
</tr>
<tr>
<td>51+</td>
<td>1,600</td>
<td>1,800</td>
<td>2,000-2,200</td>
<td></td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-8</td>
<td>1,200-1,400</td>
<td>1,400-1,600</td>
<td>1,600-2,000</td>
<td></td>
</tr>
<tr>
<td>9-13</td>
<td>1,600-2,000</td>
<td>1,800-2,200</td>
<td>2,000-2,600</td>
<td></td>
</tr>
<tr>
<td>14-18</td>
<td>2,000-2,400</td>
<td>2,400-2,800</td>
<td>2,800-3,200</td>
<td></td>
</tr>
<tr>
<td>19-30</td>
<td>2,400-2,600</td>
<td>2,600-3,000</td>
<td>3,000</td>
<td></td>
</tr>
<tr>
<td>31+</td>
<td>2,200-2,400</td>
<td>2,400-2,600</td>
<td>2,800-3,000</td>
<td></td>
</tr>
<tr>
<td>51+</td>
<td>2,000-2,200</td>
<td>2,200-2,400</td>
<td>2,400-2,800</td>
<td></td>
</tr>
</tbody>
</table>

---

a. Based on Estimated Energy Requirements (EER) equations, using reference heights (average) and reference weights (healthy) for each age/gender group. For children and adolescents, reference height and weight vary for adults, the reference man is 5 feet 10 inches tall and weighs 184 pounds. The reference woman is 5 feet 4 inches tall and weighs 126 pounds. EER equations are from the Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. Washington (DC): The National Academies Press; 2002.

b. Sedentary includes only light physical activity associated with typical day-to-day life. Moderately active includes all physical activity equivalent to walking about 3 to 5 miles per hour; in addition to the light physical activity associated with typical day-to-day life. Active includes physical activity equivalent to walking more than 3 miles per hour or 3 to 5 miles per day.

c. The calorie ranges shown do not accommodate needs of different ages within a group. For children and adolescents, more calories are needed at older ages. For adults, fewer calories are needed at older ages.

d. Estimates for females do not include women who are pregnant or breastfeeding.
Appendix J

Goal Setting Handout
Appendix I: Goal Setting Handout

Setting My Goals

- Eat at least _____ cups of fruits and _____ cups of vegetables every day.
- Participate in at least _____ minutes of moderate-intensity physical activity 3-5 days a week.

My Personal Goals

- I will eat at least _____ cups of fruits and _____ cups of vegetables daily
- I will participate in at least _____ minutes of moderate physical activity 3-5 days a week.

<table>
<thead>
<tr>
<th>Week #</th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cups Of Fruits</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
</tr>
<tr>
<td>Cups of Vegetables</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
<td># of cups</td>
</tr>
<tr>
<td>Minutes of physical activity</td>
<td># of minutes</td>
<td># of minutes</td>
<td># of minutes</td>
<td># of minutes</td>
<td># of minutes</td>
<td># of minutes</td>
<td># of minutes</td>
</tr>
</tbody>
</table>
Appendix K

Placemat for participants
Balance your plate

Half of your plate should be fruits and vegetables

Physical Activity

Participate in at least 30 minutes of physical activity 3 to 5 days a week

Fruits and Vegetables

1 cup of raw or cooked vegetables or 2 cups of raw leafy greens is equivalent to 1 cup of vegetables

1 cup of fruit juice or ½ cup of dried fruit is equivalent to 1 cup of fruit

1 ½ cups of fruit + 2 cups of vegetables = 3 ½ Cups
Appendix L

Word Game
Word Game

1. I'm diabetic and am afraid to eat certain fruits.
2. Exercise is boring
3. Grocery shopping is physically difficult for me
4. I wasn't raised eating many fruits and vegetables
5. It's too hard for me to prepare vegetables due to my arthritis
6. Exercise classes cost too much
7. Vegetables cost too much
8. Fruits and vegetables are too hard to chew
9. Fresh fruits and vegetables spoil too easily
10. I don't have time to exercise
11. I'm not someone who exercises
12. Walking in my neighborhood isn't safe or the weather is bad
13. I might injure myself
14. I don't know if I'm healthy enough to exercise
15. I can't get to the store to buy fruits and vegetables

a. Buy frozen or canned
b. Cook them longer
c. Buy ready-to-eat vegetables
d. Check with a nurse or doctor
e. Start out slowly
f. Use community van service
g. Speak with your nurse or doctor
h. Walk at the shopping mall
i. Ask a friend or relative to help you shop
j. Dance around the house
k. Take the stairs instead of the elevator
l. Get instruction
m. Try eating fruits for dessert
n. Buy frozen vegetables on sale
o. Walk and talk with friends
Appendix M

Word Game Answer Key
Word Game- Answer Key

1. I’m diabetic and am afraid to eat certain fruits. d or g
2. Exercise is boring. o
3. Grocery shopping is physically difficult for me. j
4. I wasn’t raised eating many fruits and vegetables. m
5. It’s too hard for me to prepare vegetables due to my arthritis. c
6. Exercise classes cost too much. j
7. Vegetables cost too much. n
8. Fruits and vegetables are too hard to chew. b
9. Fresh fruits and vegetables spoil too easily. a
10. I don’t have time to exercise. k
11. I’m not someone who exercises. e
12. Walking in my neighborhood isn’t safe or the weather is bad. h
13. I might injure myself. l
14. I don’t know if I’m healthy enough to exercise. d/g
15. I can’t get to the store to buy fruits and vegetables. f

a. Buy frozen or canned
b. Cook them longer
c. Buy ready-to-eat vegetables
d. Check with a nurse or doctor
e. Start out slowly
f. Use community van service
g. Speak with your nurse or doctor
h. Walk at the shopping mall
i. Ask a friend or relative to help you shop
j. Dance around the house
k. Take the stairs instead of the elevator
l. Get instruction
m. Try eating fruits for dessert
n. Buy frozen vegetables on sale
o. Walk and talk with friends
Appendix N

Coloring Pages
Fruits
Appendix O

Recipe
Strawberry Banana Parfait

Description:
Whether you are looking for a fruit-filled breakfast option or a better-for-you dessert – enjoy the flavors of layered seasonal fruit, crisp flakes and creamy yogurt in this delicious parfait.

Ingredients:
⅛ medium ripe banana, mashed
⅛ teaspoon vanilla
⅜ cup plain non-fat yogurt
⅛ cup sliced fresh strawberries
⅛ cup complete bran and wheat flakes ready-to-eat cereal

Directions:
1. Stir banana and vanilla into yogurt
2. In one 10-12 ounce glass, alternate layer the yogurt mixture, strawberries and cereal. Serve immediately.

Makes 1 serving

Nutrition Facts

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Value</th>
<th>%DV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Sodium</td>
<td>200 mg</td>
<td>8%</td>
</tr>
<tr>
<td>Potassium</td>
<td>448 mg</td>
<td>13%</td>
</tr>
<tr>
<td>Calcium</td>
<td>200 mg</td>
<td>20%</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>95 IU</td>
<td>24%</td>
</tr>
<tr>
<td>(0.66 mcg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietary fiber</td>
<td>7g</td>
<td>28%</td>
</tr>
</tbody>
</table>
January 5, 2015

Grand Valley State University
1 Campus Dr.
Allendale, MI 49401-9403

Dear Ms. Mwanda;

Thank you for your request for print (Doctoral Dissertation) format of the following from Effective Clinical Practice:

Figure 1, Effective Clinical Practice, 1998, Vol1, Chronic Disease Management: What Will It Take to Improve Care for Chronic Illness? Wagner EH

Permission is granted to print the preceding material with the understanding that you will give appropriate credit to Effective Clinical Practice as the original source of the material. Any translated version must carry a disclaimer stating that the American College of Physicians is not responsible for the accuracy of the translation. This permission grants non-exclusive, worldwide rights for this edition in print (Doctoral Dissertation) format for not for profit only. ACP does not grant permission to reproduce entire articles or chapters on the Internet unless explicit permission is given. This letter represents the agreement between ACP and ALICE MWANDA, MSN FNP for request WAECP1318063 and supersedes all prior terms from the requestor.

Thank you for your interest in Annals of Internal Medicine. If you have any further questions or would like to discuss the matter further, please contact me at 856-489-8555 or fax 856-489-4449.

Sincerely,

Gina Brown
Permissions Coordinator
Appendix Q

Dr. Susan Walker Copyright Permission to Use Health-Promoting Lifestyle Profile II
Hello Dr. Susan Walker,

My name is Alice Mwanda, MSN, RN, FNP. I am a Doctorate of Nursing Practice student at Grand Valley State University, Grand Rapids Michigan. For my doctoral project/dissertation, I am studying the effectiveness of an educational intervention on weight management. I have already obtained written permission from Dr. Nola Pender to use Health Promotion model that she developed. I am hereby writing this email communication to request permission to use the Health-Promoting Lifestyle Profile II psychometric tool.

Sincerely,

Alice Mwanda MSN, RN, FNP

Hello, Alice

You may use the HPLPII for your research project.
Dear Colleague:

Thank you for your interest in the Health-Promoting Lifestyle Profile II. The original Health-Promoting Lifestyle Profile became available in 1987 and has been used extensively since that time. Based on our own experience and feedback from multiple users, it was revised to more accurately reflect current literature and practice and to achieve balance among the subscales. The Health-Promoting Lifestyle Profile II continues to measure health-promoting behavior, conceptualized as a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization and fulfillment of the individual. The 52-item summated behavior rating scale employs a 4-point response format to measure the frequency of self-reported health-promoting behaviors in the domains of health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management. It is appropriate for use in research within the framework of the Health Promotion Model (Pender, 1997), as well as for a variety of other purposes.

The development and psychometric evaluation of the English and Spanish language versions of the original instrument have been reported in:


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A copy of the instrument (English and Spanish versions), scoring instructions, an abstract of the psychometric findings, and a list of publications reporting research using all versions of the instrument are available for download.

Sincerely,

Susan Noble Walker, EdD, RN, FAAN
Professor Emeritus
References


