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Research Article

Addressing Obesity and Inactivity in Females with Severe Mental Illness [SMI]

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Abstract

Obesity in the Severely Mentally Ill [SMI] has become a significant problem and cause of morbidity and early mortality. SMI clients are 50% more likely to be obese compared to the general population. Heart disease is the leading cause of death in this population. To date, little has been done to address this epidemic in either the primary care or psychiatric settings. The purpose of this study was to assess the effectiveness of an advanced practice nurse-run intervention utilizing 10 weekly sessions across three domains: weight loss, time spent in physical activity, and changes in basic health knowledge. A psychiatric rehabilitation model served as a naturalistic framework for the study, as this model's strategies to facilitate goal achievement are thoroughly integrated in community mental health settings. The review of literature supported behavioral interventions across mental health treatment settings and largely found modest improvements in multiple outcomes including weight and physical activity. The current research study was a pilot project employing a descriptive, pretest-posttest design. Of the 32 women who met inclusion criteria, 18 enrolled in the study. Pre- and post-intervention paired t-test results indicated statistically significant weight loss and increased time spent in physical activity among the completers and partial completers with no significant difference found in basic health knowledge. While the pilot-study nature of this project imposes limitations on the findings, implications include that advanced practice nurses are well positioned to develop, design and implement strategies that promote collaborative, integrated physical and mental health care with the primary aim of reducing medical co-morbidities in this vulnerable population.

Keywords: Severe Mental Illness (SMI); Females; Obesity; Medical co-morbidities

Introduction

Obesity is a considerable problem in America today, and is even more prevalent among those who suffer from Severe Mental Illness [SMI] [1]. The epidemic of obesity and interrelated health co-morbidities has been documented extensively in this special population. The chronically mentally ill are 50% more likely to be overweight or obese compared to the general population [2]. Obesity doubles the risk of developing coronary artery disease, stroke, and Type II Diabetes Mellitus [3] as well as increases the risk of developing hypertension, high cholesterol, and sleep apnea [4]. Obesity in those with SMI is associated with a significant decrease in life expectancy, decreased quality of life, early mortality [5], multiple medical co-morbidities, and substantial economic burden [6]. Heart disease, not suicide, is the leading cause of death among the chronically mentally ill [7]. The risk of premature death for those with SMI is 2.4 times that of the general population [8]. Those with SMI lose decades of potential years of life compared to their general population counterparts, stemming largely from an increased risk for cardiovascular disease [9]. Among certain subgroups of those with SMI, the mortality gap in recent decades has continued to widen, despite advances in mental health treatment [10]. According to results of a nationwide cardiometabolic screening program for consumers from 219 mental health facilities, group practices and community behavioral health centers between 2005 and 2008, the prevalence of cardiometabolic risk factors was "substantial and frequently untreated" [11].

The problem of obesity in those with SMI is complex and multi-faceted. Scientists have identified numerous contributing factors with varying degrees of causality. Current literature is inundated with information linking multiple psychotropic medication classes to the development of side effects such as weight gain, obesity, elevated triglycerides, diabetes and hypertension [12]. In addition, the role of gender is beginning to reveal implications in metabolic diseases and associated co-morbidities. It is only recently that gender medicine and gender-specific aspects in diagnosis, treatment and disease prevention are utilized shape policy, care and research [13]. Recent evidence suggests that there may be a genetic predisposition for components of metabolic syndrome in those with mood disorders and schizophrenia [14]. Though causality has not been directly identified, an unhealthy diet and sedentary lifestyle are thought to contribute to the incidence and prevalence of obesity in this population [2]. The significance of these lifestyle factors is that they are potentially modifiable risk factors; and therefore, are an important focus of the current project.

Though health promotion initiatives targeting nutrition and physical activity have increased over the last decade, those with SMI remain largely neglected [15]. Mental health treatment centers do not routinely offer health and wellness interventions that address nutrition

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and physical activity [8]. Primary health care providers often lack the resources necessary to manage and treat medical co-morbidities in the SMI population as a result of multiple obstacles. Though there is evidence of an increased interest in improving collaboration between primary and psychiatric health care professionals [16-18], this has not translated into mainstream clinical practice in the United States. Routinely in general practice and mental health treatment settings, little is done to intervene and improve the health risk profiles of those living with SMI [19,20].

Psychiatric nurses and, more specifically, advanced practice psychiatric nurses, play vital roles in the lives of SMI consumers. Advanced practice psychiatric nurses are in a unique position not only to legitimize the priority of addressing obesity and related health co-morbidities in this population [21], but to implement evidence-based practice strategies through a more integrated and holistic nursing role in mental health care. Psychiatric nurses, like the mental health care system as a whole, can no longer afford to ignore the epidemic of obesity in this vulnerable population. As influential patient advocates, psychiatric advanced practice nurses are well suited to lead the efforts to improve the physical health of mental health consumers.

Theoretical framework

The early work in the field of psychiatric rehabilitation was pioneered in the 1970s by those who recognized the value of re-conceptualizing and re-defining 'recovery' in the context of severe mental illness. The basis of psychiatric rehabilitation is built upon guiding values of empowerment, competence, and recovery [22]. Many themes and concepts that originated in the psychiatric rehabilitation literature have become public domain. Ideas, concepts and guiding principles have become embedded in mainstream mental health treatment settings [23]. Recovery, in this context, is not synonymous with cure or absence of illness. Instead, recovery refers to assuming the highest level of responsibility over one's life and functioning as actively and independently as possible in society within the context of SMI [24]. Goals of psychiatric rehabilitation have been well established, as have strategies that can be implemented to facilitate those goals. These strategies include instrumental and social support, goal setting, skills training, transfer training, and cognitive rehabilitation among others [25]. These strategies take the unique needs of the SMI consumer into account. Because of the focus of the psychiatric rehabilitation model, principles and strategies of this model served as a natural theoretical framework for this study.

Literature Review

The epidemic of obesity coupled with a sedentary lifestyle among consumers with SMI has been explored extensively in the literature. Those in primary care and psychiatric settings have acknowledged this problem and have worked to identify causative factors and barriers to treatment. Though researchers have identified a combination of factors that contribute to this problem, the degree of causality has not yet been strongly supported by scientific literature. Beyond identification of the epidemic of obesity in this select population and exploration of causative factors, scientific support of interventions to adequately address obesity in those with SMI is lacking. Until recently, there has been little interest in improving and addressing the physical health of mental health consumers.

According to the literature reviewed for this study, modest improvements in weight and physical activity can be achieved in SMI consumers utilizing a comprehensive and integrated approach focusing on a combination of nutrition and physical activity components. Caution must be exercised regarding these findings, as there are significant limitations in the current literature that remain to be addressed. Primary among these limitations are the small sample sizes, high attrition rates, and short duration of most studies. There have been few studies that measure outcomes beyond a few months. In addition, the designs of most studies have been found to have a high degree of variability and a lack of consistent outcome measures of interest.

Methods

Design

The current research study was a pilot study employing a descriptive, pretest- posttest design. All subjects were assigned to receive the intervention.

Population

A naturalistic, convenience sample was used from a single site private, non-profit community mental health center. Subjects were recruited for the study through self-referrals based on printed advertisement material displayed in the mental health center, or were referred to the project through mental health clinicians. Inclusion criteria included females with a diagnosis of a serious mental illness, body mass index (BMI) greater than or equal to 25, women who are responsible for at least 50% of household grocery shopping and meal preparation, aged 18 and older, and had obtained medical clearance from her primary care provider. Exclusion criteria included a recent history of non-adherence to prescribed treatment, a diagnosis of intellectual disabilities (previously mental retardation), physical conditions that prevented participation in physical activity, acute mania and/or psychosis, history of anorexia nervosa and/or bulimia nervosa, and history of gastric bypass or other surgical obesity treatment.

Procedures

The research study was approved by the Carlow University Institutional Review Board (IRB) after an expedited review. The IRB administers both the General Assurance of Compliance with the United States Department of Health and Human Services Policy for the Protection of Human Subjects and the Carlow University policy covering the protection of human subjects. Approval for this study was also obtained by the study agency's Executive Director, under the direction of the Board of Directors, and the Medical Director. Administrative staff were easily accessible to the primary nurse researcher and supportive of the current study.

Instruments

A number of different instruments were utilized to measure outcomes. A single, standard doctor's office scale was used to measure height and weight. A manual Omron brand blood pressure cuff was used to measure blood pressure. Both normal adult and obese cuffs were utilized, dependent on the arm circumference of each participant. Waist circumference was measured using a standard tape measure at the level of the umbilicus. One tracking log was utilized to track the number of food group servings consumed by each subject

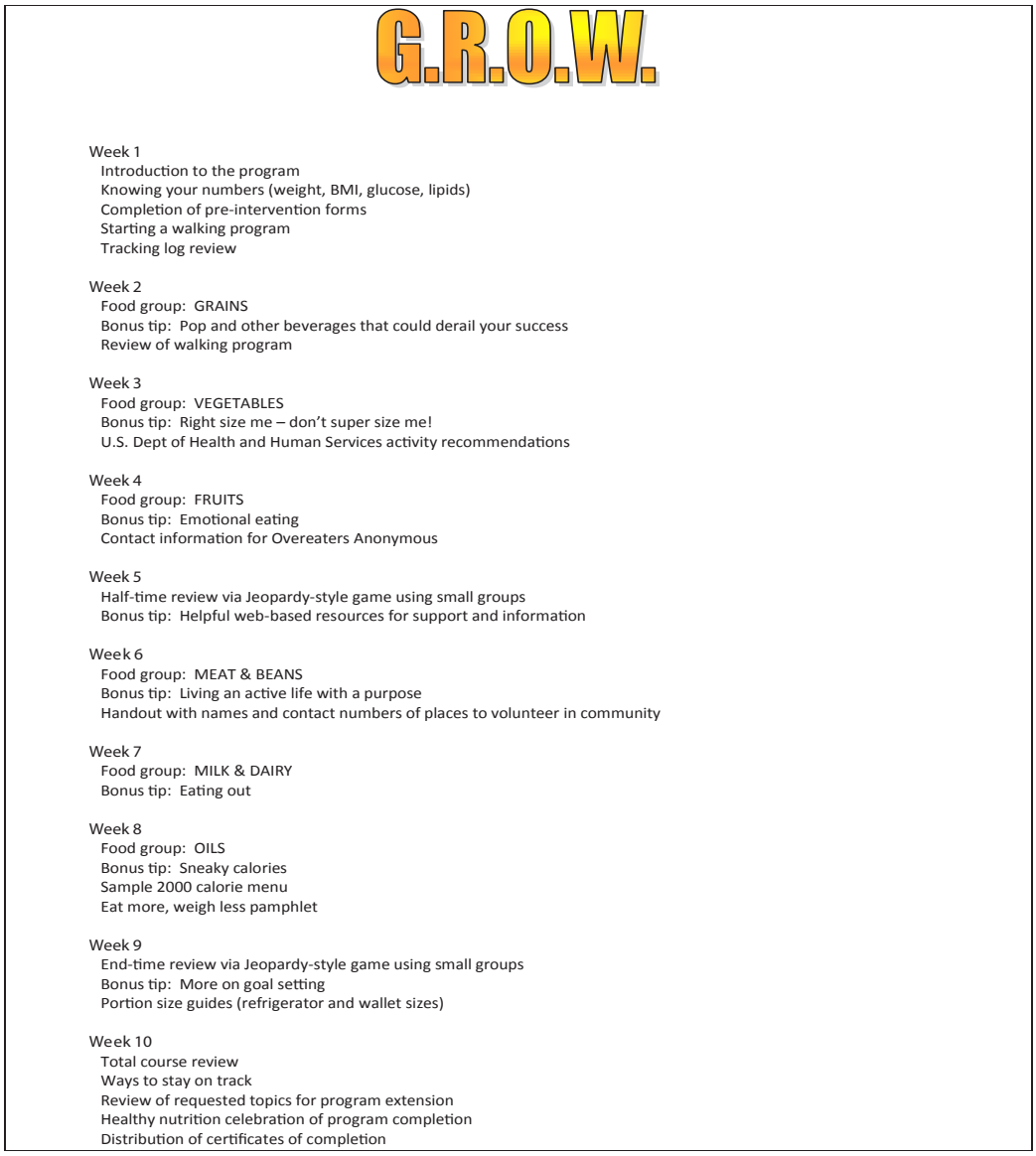

Figure 1: Course Outline/Overview.

on a weekly basis. One tracking log was utilized to track time spent in physical activity on a weekly basis. Tracking logs were both self-report measures and subject to error.

Intervention curriculum

The primary researcher developed a 10 week manualized psychoeducation intervention (Get Rolling on Wellness [GROW]) (Figure 1) tailored for females with SMI using nutritional recommendations from the United States Department of Agriculture (https://www.choosemyplate.gov/MyPlate). Physical activity recommendations were based on guidelines from the United States Department of Health and Human Services. Supplementary material was adopted from other reliable resources. Each weekly session was approximately 90 minutes in length and followed a structured format. At the conclusion of the 60 minute educational portion, participants were invited to complete a commercial 25 minute walking video.

Data collection plan

The primary researcher and the assistant psychiatric Registered Nurse (RN) were in attendance for each session over the 10 week intervention. The role of the RN was to collect data and measurements and to de-identify the data prior to giving it to the primary researcher.

After obtaining informed consent from each subject, participants met with the primary researcher at the beginning of the study. During this time, height, weight, blood pressure, and waist circumference were measured by the RN. Each participant was asked to record a 24 hour food recall. Each participant was also asked to estimate the amount of time spent in moderate physical activity over the previous 7 days. Lastly, participants were asked to complete a short general health questionnaire to measure general health knowledge.

Attendance was recorded weekly for the 10 weeks of the study. At each weekly session, each participant was weighed. Participants were

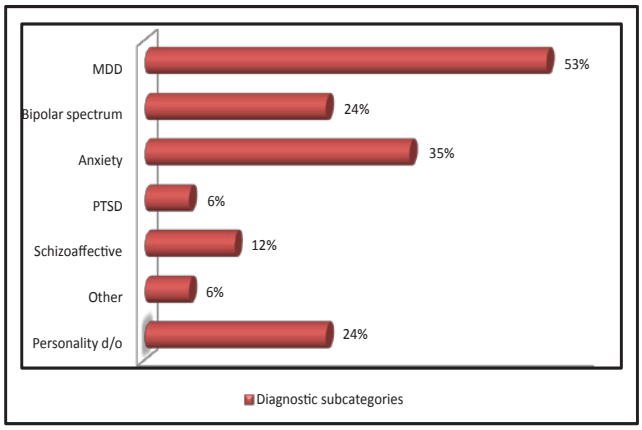

Figure 2: Diagnostic subcategories (*n*=13).

asked to keep both a nutritional tracking log and a physical activity tracking log, which was turned in at the conclusion of the week for the researcher's review.

At the conclusion of the study, each participant was weighed. A blood pressure measurement was recorded. Waist circumference was measured. Participants also re-took the same short general health questionnaire that they completed prior to beginning the study.

Data analysis plan

Demographic data was analyzed to determine if there are differences between the pre- and post-sessions regarding dependent variables. To examine the efficacy of the intervention, the data was analyzed using a pre- and post-intervention paired t-test.

Results

Participants

Following obtaining IRB approval, 32 referrals were obtained for potential participants in the study. Of these, 18 subjects who met all eligibility criteria were enrolled and began the 10-week intervention sessions. Eighty-six percent of those not enrolled did meet study inclusion criteria and were invited to join, but declined to enroll as participants or attend the first introductory session.

The mean age of participants was 40. The subjects represented a variety of psychiatric diagnostic subcategories including major depressive disorders (53%) with and without psychosis, bipolar spectrum disorders (24%), anxiety disorders (35%) , post-traumatic stress disorder (6%), schizoaffective disorder (12%), impulse control disorder (6%), and personality disorders (24%) (Figure 2). The average participant had been involved with mental health treatment for 12 years. On self-report, all but one participant reported one or more medical co-morbidities including Type II Diabetes Mellitus, elevated total cholesterol and/or triglycerides, fatty liver disease, obstructive sleep apnea, and hypertension. The average number of total prescription medications a subject was prescribed was 5.3. The average number of psychiatric medications prescribed per subject was 2.6. Sixty-nine percent of subjects were prescribed psychiatric medications that have known weight gain potential including second generation atypical antipsychotics, tricyclic antidepressants, and monoamine oxidase inhibitors. Forty-three percent of participants

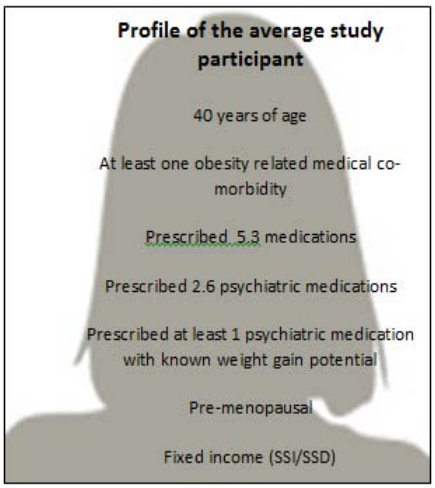

Figure 3: Profile of the average study participant (*n*=13).

were taking at least one over the counter herb, vitamin, or nutritional supplement in addition to their prescription medications.

The majority (81%) of participants were pre-menopausal, 50% were current smokers and 89% reported being financially supported by social security disability with reported net monthly incomes averaging less than $900 per month. All but one participant were high school graduates

or obtained their GED. Beyond high school, two completed a trade school, one completed some college courses, one obtained an associate's degree, one completed a bachelor's degree, and two had master's degrees. According to the background survey, all participants named weight loss and improved health as their main reasons for joining the study.

Of the enrolled subjects, seven completed the study, six partially completed (defined as attending more than three sessions, but not completing the study) and five did not return after the first introductory session. In comparing demographic variables across the three groups (i.e., completers, partial-completes, withdrawals), there were no obvious patterns of differences in diagnostic category, years in mental health treatment, medical co-morbidities, prescription medication utilization, or income (Figure 3).

Three of the 5 subjects who withdrew after the introductory session had college degrees. At the end of the 10-week session period, surveys were mailed to each subject who had not completed the program in its entirety to assess reasons for not completing and asking for feedback to improve the program and identify obstacles or program deficiencies that may have

contributed to non-completion of the sessions. One survey was returned, which indicated that personal issues prevented the participant from completing the sessions but offered no suggestions for improvement.

Summary of findings

A paired t-test was used to evaluate the impact of the intervention on pre- and post-scores in weight, time spent in physical activity, and

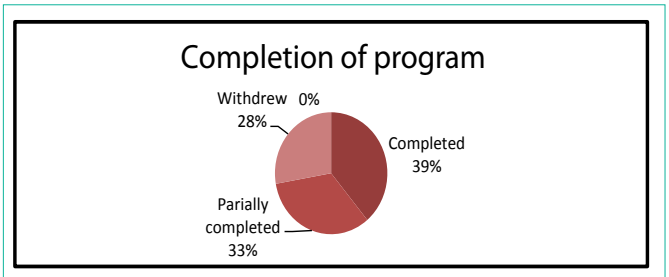

Figure 4: Subject participation (*n*=13).

scores on a general health quiz/inventory. At the 0.10 level, there was a significant difference between both the mean weight (t = -1.8266, p = 0.0927) and exercise (t = 2.0521, p = 0.0626) at post-intervention from pre-intervention scores. However, at the 0.10 level, there was no significant difference between the mean health quiz/inventory scores (t = 1.8708, p = 0.1106) at post-intervention from pre-intervention scores.

Discussion of Findings

The purpose of this study was to assess the effectiveness of the nutrition and physical activity intervention comparing before and after the 10-week sessions across three domains: weight loss, time spent in physical activity, and changes in pre- and post-intervention basic health knowledge. The results indicated that the intervention resulted in statistically significant weight loss and increased time spent in physical activity, but did not result in increased general health knowledge. It was this author's experience that the statistically significant improvements in weight loss and physical activity were also clinically significant, as comparatively small weight losses impart overall health benefits including an improved perception of physical and emotional well-being [15,26,27] and that a reduction of body weight by merely 5-10% has been shown to improve medical co-morbidities of obesity [28]. Having achieved both statistical and clinical significance in this pilot study suggests that this type of program in the context of a traditional community mental health setting may be helpful in facilitating SMI consumers meet their physical healthcare needs.

Results of this pilot study were concordant with similar studies that examined multiple approaches for management of obesity in the SMI population [1,4,28,29-32]. This study adds to the professional evidence indicating that behavioral approaches can be effective in achieving modest weight loss for people with SMI in variable treatment settings. The present study results are consistent with 7 of 8 reviewed studies conducted in the outpatient setting [1,4,16,29-32], all of which revealed variable degrees of success across several outcome measures.

Other consistent findings between this and similar studies included small sample sizes [8,15,26,28,29] and high attrition rates [4,15,31]. This suggests that attrition is not likely due to the design of the studies themselves, but is more reflective of the widely acknowledged, but less often researched and reported, reality that noncompliance with psychiatric treatment is endemic in community mental health. The often unwritten, but widely accepted generalization in psychiatry is to expect non-adherence to treatment in one-third of the population. Studies addressing obesity and other medical co-morbidities in the SMI population must continue to explore and test ways to address non-adherence issues as part of a systemic change needed in community mental health care generally, if this endemic is to be impacted. In addition to system's level research efforts, these findings suggest that interventions to address such an endemic will probably not be found and solved at the individual or even treatment-center level but also call for efforts aimed at the system's (e.g, health policy, reimbursement, addressing barriers, etc.) level if healthcare providers are to be effective in meeting and helping this population overcome these challenges.

The current study employed a number of psychiatric rehabilitation principles with evidence-based weight loss strategies, similar to a recent study by [4]. Though a theoretical framework was not specifically identified in most studies reviewed, guiding principles and strategies were implied in the methodology in some [28]. Strategies used to facilitate the goal achievements in psychiatric rehabilitation that were incorporated into the current study included goal setting, provision of social support, skills training, and compensation for cognitive impairments. Though it is common to find utilization of goal setting and social support in many weight management programs, this study wove these strategies throughout the entire program in order to facilitate accessibility for women with SMI. A concerted effort was made to assist in the goal-setting process, using the SMART (specific, measurable, attainable, realistic and timely) acronym as a framework. Goal-setting was discussed at each session and clear, concise feedback was provided to participants who chose to share their weekly goal(s) with the group. Utilization of a psychiatric rehabilitation framework may have positively impacted the current study's results, as principles and strategies are thoroughly integrated throughout the traditional mental health programs at the study site. This offered a seamless transition in approach from traditional mental health services to this unique program, though the content was unfamiliar.

Throughout this current study, nutrition was touted as the primary aim, whereas physical activity was encouraged largely as a way to maintain weight loss resulting from nutritional changes, as "caloric restriction remains the principal means of achieving weight loss in overweight and obese individuals" [28]. General health knowledge scores did not improve significantly from pre- to post-intervention. Surprisingly, pre-intervention knowledge scores were higher than expected. One interpretation of this finding is that these subjects may already have had a minimal basic health knowledge such that the information included during the intervention was insufficient to (or unnecessary for) increasing this knowledge significantly across the 10 week sessions. A second interpretation is that knowledge acquisition and attainment is not enough, in and of itself, to impact behavioral change, which is strongly supported by multiple health behavior change models and theories. Changes in health related behavior require additional skills, beyond merely knowledge attainment, for meaningful change to take place and be maintained. Both interpretations further support the need for ongoing study on the relationship between health knowledge and long-term behavior change as well as for integration of behavioral programs to address obesity and other related medical co-morbidities into traditional mental health settings, more so than programs that simply disseminate health information without behavioral components.

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