

NEW-R INTERVENTION FOR CLIENTS WITH SEVERE MENTAL ILLNESS AND
OBESITY: GRANT WRITING FOR IMPLEMENTATION FUNDS SUPPORTING
OCCUPATIONAL THERAPY INTERVENTIONS

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Abstract

Increasing numbers of people suffer from obesity and severe mental illness co-morbidly. If these conditions remain untreated, they can harm an individual's health and well-being. Unfortunately, there are very few programs currently available that target both management and improvement of these conditions simultaneously. Even so, despite the lack of programming options, it must be noted that the NEW-R program strives to reach those goals, although there hasn't been an abundance of literature supporting the effectiveness of this program. This poses a concern for occupational therapy practitioners who hope to assist their clients in managing these conditions as occupational therapy treatments must be based on evidence. To build the knowledge base for practitioners and their clients, this capstone project seeks to address this need by proposing an R03 grant to fund much-needed research. This will provide occupational therapists with the tools they need to implement effective treatment. It will provide well-supported intervention options, particularly NEW-R, for clients struggling with obesity and severe mental illness.

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Introduction

Obesity has become a growing concern in modern society. Obesity can be defined as the condition in which an individual carries excess weight in the form of adipose tissue, leading to a body mass index (BMI) reading of >30 (Centers for Disease Control and Prevention, 2022). It is imperative to note that diabetes is one of the most prominent physical health concerns for individuals with severe mental illness (SMI); this may occur alone or secondary to obesity (Bradshaw & Mairs, 2014). Type 2 Diabetes is a metabolic disorder most strongly associated with obesity; those with obesity account for 44% of diabetic cases, and this incidence is expected to double to 300 million by 2025 (Leitner et al., 2017). Obesity poses a risk to the health of the public and the individual. In addition to this global concern, there has been an increase in the number of people suffering from SMI. SMI are generally non-physical illnesses that can affect an individual at any point in their lifetime, whether they suffer from SMI on a short-term or chronic. Psychiatric and medical services are often necessary for managing SMI due to the severity of the disability associated with the illness. Several disorders classified as SMIs include but are not limited to schizophrenia, bipolar disorder, schizoaffective disorder, and major depression. According to the Substance Abuse and Mental Health Services Administration (2022), these illnesses can have internal and external triggers in addition to affecting cognition, thinking, and emotions. The reach of these conditions is extensive, and there are currently few options for treatment. While both disorders can occur independently, SMI and obesity are often comorbid disorders and can exacerbate each other if left untreated. Afzal et al. (2021) report that obesity is 3.04 times more likely to be diagnosed in individuals with SMI. Since SMI can worsen and result in weight gain and the reverse, it is an ongoing problem. If one or both conditions are left untreated, the chances of other health complications may arise over time. This

grim cycle necessitates that individuals seeking treatment for one or both conditions seek interventions that address both conditions. To reduce weight and symptoms of SMI, clients may need to adopt healthy habits or change their lifestyles. They will ultimately be able to improve their overall health as a result. Clients may find it challenging to make these changes since it often involves overhauling their daily routines, roles, and rituals. Clients may be deeply accustomed to these routines. The NEW-R program is proposed as a solution to ensure the successful implementation of these changes. The NEW-R is a program centered on lifestyle redesign. The client is taught the basics of healthy eating and movement and then invited to trial these changes for themselves within the group and in their daily lives (Center on Integrated Health Care & Self-Directed Recovery, n.d.). To determine if the NEW-R program is a viable intervention option for clients, the following PICO question is asked:

In clients with a serious mental illness (SMI) diagnosis who have comorbid obesity, how effective is the NEW-R program in pursuing a healthier BMI and reducing symptoms of SMI as demonstrated by qualitative self-report and objective numerical reductions in BMI as compared to no intervention when it is implemented within an 8-week period?

Since accessibility to this type of program may be inaccessible to those in need, the purpose of this project is to make this type of programming available through Southern Adult Mental Health Services. This non-profit organization serves the needs of individuals with SMI in the Las Vegas metropolitan area. To provide NEW-R programming to clients in this population and ensure its effectiveness, there must be a solid evidence base to support the implementation of such interventions. There have been relatively few completed studies on this subject. Therefore, this capstone project, which aims to prepare a completed R03 grant application, will serve as a potential source of funding to obtain the necessary capital to fund integral research supporting occupational therapists' use of the NEW-R program and facilitating the delivery of effective treatment to clients of the target population. Accordingly, the PICO question addresses a specific

question that will be answered once the project product, the R03 grant application, is selected and funded. It is at this point that the research can begin.

As a profession, occupational therapy relies on evidence-based interventions to assist clients. Consequently, in all cases, if treatment is being provided to a client, there is literature that describes in detail the tools, techniques, and methods that will be used to assist said client. For practitioners seeking treatment options for both SMI and obesity, this poses a challenge. It is not easy to treat these conditions as little research supports their treatment. A key objective of this capstone project is to develop grant writing and administrative skills through capstone projects and other professional opportunities integral to occupational therapy. These skills form the basis for an evidence-based intervention to be crafted and strengthened in occupational therapy. This project aims to provide clinicians with a basis of knowledge to assist them in implementing care for those with obesity and SMI who are underserved.

Furthermore, research is of value to occupational therapy practitioners in providing intervention options for clients. By providing these intervention options, it is possible to improve the management of severe mental health conditions, which may significantly impact a client's daily life, quality of life, ability to engage in meaningful activities, and overall health. Unless treated, SMI and obesity may severely impair a client's autonomy, independence, and ability to function daily.

Statement of the Problem

There is a lack of evidence regarding the effectiveness of intervention options for clients seeking treatment for SMI and obesity simultaneously. It is important to note that a severe mental illness (SMI) can be defined as a generally non-physical illness that can affect an individual at any point in their lifetime, whether they are suffering from them on a short-term or chronic basis (National Institute of Mental Health,2023). Additionally, obesity can be defined as the condition in which an individual carries excess weight in the form of adipose tissue, leading to a body mass index (BMI) reading of >30 (Centers for Disease Control and Prevention, 2022). These definitions will assist in understanding the problem that this Capstone Project addressed, and the complexities associated with attempting to provide interventions to mitigate these concerns.

As a result of antipsychotic medications, lifestyle, socioeconomic status, and access to resources, individuals with SMI are at an unusually high risk of obesity. According to the National Institute of Diabetes and Digestive and Kidney Diseases (2021), "...2017–2018 data from the National Health and Nutrition Examination Survey (NHANES) indicate that nearly 1 in 3 adults (30.7%) are overweight, more than two out of five adults (42.4%) are obese, and approximately one out of eleven adults (9.2%) have severe obesity". By examining these statistics, we can gain a better understanding of how common obesity is in the general population. According to Tremmel et al. (2017), "Obesity constitutes an important threat to national and global public health in terms of prevalence, incidence, and economic burden. In 2014, more than 2.1 billion people, nearly 30% of the global population, were overweight or obese, and 5% of the deaths worldwide were attributable to obesity. If the incidence continues at this rate, almost half of the world's adult population will be overweight or obese by 2030". Atop

of the societal concerns, there are detriments for the individual. Obesity increases a client's risk of Type II diabetes and cardiovascular concerns such as myocardial infarctions and cardiovascular disease (Bradshaw & Mairs, 2014). Considering that obesity is associated with additional conditions and concerns that may result in a reduction in quality of life, the ability to take care of oneself, as well as the need for additional medical intervention or medications, obesity among this patient population needs to be managed; however, it is often not the focus of intervention for this population (Wykes et al., 2018). It is important to note that this concern exists simultaneously for those seeking treatment for SMI. The National Institute of Mental Health (2022) states, "Nearly one in five U.S. adults has a mental illness." According to this statistic, twenty percent of adults have a mental illness. It is also evident that more needs to be done to reduce the health risks for these patients since they make up a substantial portion of our society, and their concerns become public health concerns as they increase in number.

Further compounding these health risks is the stigma and discrimination that people with obesity may experience, which can exacerbate their mental health and well-being. As a result of this stigma and discrimination, obese patients may face an even greater sense of isolation and find it more difficult to seek treatment and assistance (Hajek, Kretzler, & König, 2021). Consequently, unhealthy behaviors may cascade and further exacerbate health risks. With obesity causing independent concern, it is evident that more must be done to help reduce the health risks for these individuals as they make up a large portion of our society; their concerns are rapidly becoming a global public health concern as this number increases.

This global concern warrants better management by healthcare systems due to their impact on the economy, workforce, and lifestyle culture. According to Fekadu et al. (2019), those with SMI may struggle with employment and family demands and require more

involvement in the healthcare system. This may cause decreased productivity and increased medical expenses. According to Kjellberg et al. (2017), similar concerns are obesity-related risks of increased healthcare expenses, increasing total average healthcare costs by 4. It is imperative to realize that while both disorders can occur independently, they are often comorbid illnesses that can exacerbate one another if left untreated. Afzal et al. (2021) determined that individuals with a diagnosed SMI have 3.04 times increased likelihood of being diagnosed with obesity than individuals without a diagnosed SMI. It is imperative to note that the risk of additional health complications over time also accompanies this risk.

For the individual, the physical health risks are severe, one of the most detrimental problems being diabetes. Many factors play a role in developing obesity and diabetes in individuals with SMI. However, metabolic disorders play a significant role, given that they are a side effect of many psychiatric medications. Some other problematic consequences of these medications include avolition, sedation, and satiety reduction. This can lead to an increased risk of obesity and diabetes (Bradshaw & Mairs, 2014). As many SMIs are chronic concerns for individuals, these issues negatively impact the individual's overall well-being, which leads to obesity and diabetes. Recognizing these concerns means that the argument may be made that an individual's overall quality of life is likely to suffer due to SMI, obesity, and related consequences. Obesity must be addressed within this population for several reasons. However, the most noteworthy may be the physical consequences that may occur when a person suffers from a disorder such as diabetes. This is a concern since diabetes carries many physical and mental risks to the client. One such severe risk is limb loss, which may result from diabetic complications (Walicka et al., 2021). Lower extremity amputations (LEA) are a common risk associated with diabetes; the disease accounts for 45%-70% of all cases, according to Caruso et

al. (2021). For people with SMI, this poses an immense risk due to impeding already impaired mobility, increasing dysphoria and low mood, fatigue, and increased infection risks.

Individuals with severe mental illness often require medical management of their conditions using pharmaceuticals that suppress physical and mental functions. These pharmaceuticals include antidepressants, anti-anxiety medications, and antipsychotics, among others. When body systems are suppressed to treat these disorders, individuals may become lethargic, have a lower metabolism, experience fatigue, or other impending symptoms. People may gain additional weight because of these factors and have more difficulty losing weight. According to Álvaro-Jiménez et al. (2008), "...Up to 80% of patients treated with antipsychotics experience significant bodyweight gains. Weight gain adversely affects clinical outcomes and the wellbeing of patients with schizophrenia." Even though schizophrenia is just one type of SMI, these findings are related to antipsychotic medication side effects. These medications may be utilized to address various diagnoses or symptoms.

Furthermore, other psychotropic agents, such as antidepressants that aim to manage psychological disorders, have a similar effect on weight gain. These increase the likelihood that individuals being treated for SMI may have associated weight gain (Shrivastava & Johnson, 2010). Given that many individuals with SMI have symptoms that may be debilitating and must be managed, it is reasonable to assume that this risk of weight gain needs to be mitigated without stopping the associated medication. To address these concerns, lifestyle changes are the best way to ensure lasting improvement for the individual; these changes can be taught through interventions such as lifestyle redesign-type programming (Jessen-Winge et al., 2020).

Considering this grim cycle, individuals need to seek treatment for these conditions. Treatment plans should include lifestyle redesign interventions as part of the treatment process.

According to Jessen-Winge et al. (2020), programs aimed at reducing body weight and making healthy lifestyle changes for those with SMI have proven successful with the right conditions, including social support, creating self-belief, and maintaining habit changes. These successful programs improve vital readings such as blood pressure, cholesterol, blood sugar, and other mental health improvements such as better overall mood, improvement in goal-setting abilities, and increased motivation (Dieterle, 2018). As a result, when there is a positive impact on the mental health status a person experiences, there is subsequent improvement in the overall perception of quality of life for the individual. To make these changes possible, the individual may encounter challenges, as it is often necessary to upheave their everyday routines, roles, and rituals, which may pose challenges for them. Often, these routines are deeply ingrained in the individual's life and may seem insurmountable, but optimization is possible with appropriate support and intervention (Pyatak et al., 2022). These risks to the client's overall well-being highlight the importance of the problem for occupational therapists. Accordingly, treating these populations is necessary to prevent further deterioration of their health. Thus, the longer these clients remain without proper intervention, the more likely their physical and mental health conditions will worsen (Bradshaw & Mairs, 2014). These issues can become more challenging to manage if they are not addressed. A key role occupational therapists play is to aid these clients in making positive changes to regain control of and improve their overall health. By designing a treatment plan, an occupational therapist can assist a client in developing strategies for managing daily tasks and activities related to eating habits; for example, if a client's current mealtime routine is evaluated, it may be possible to alter the client's eating time or foods consumed, resulting in a change in weight, mood, or cognitive functioning.

Currently, these clients do not have adequate, well-researched options for treating both conditions simultaneously, which is problematic, given the intensity with which both conditions affect the daily routines of these individuals. As occupational therapists support their clients' activities of daily living (ADLs) and instrumental activities of daily living (IADLs), these issues become directly relevant to their practice. Managing severe mental health conditions and obesity may adversely impact their clients' daily lives, quality of life, and ability to engage in meaningful activities, resulting in reduced health outcomes. Symptoms of their diagnoses can be exacerbated or increased because of these concerns. Furthermore, they may impair the client's autonomy, independence, and ability to thrive. There are very few programs, such as NEW-R, or programs like it, in the literature addressing these concerns, leaving the target population with an unmet need. Therefore, grant-funded, field-based research is necessary to support the program and others like it. As a result of this project, a grant application will be developed to achieve this objective. As a result of this tool, the investigator can obtain adequate funding to conduct research. This will contribute to knowledge creation and the advancement of occupational therapy in general.

The outcome of this capstone project was a fully developed and drafted R03 grant application to the National Institutes of Health (NIH Central Resource for Grants and Funding Information, 2022). With the assistance of this capstone project, the grant application can be submitted to the funding source as a ready-to-submit document. A completed R03 application will expedite obtaining research data to support this program. This preparedness will enable the process to proceed faster as preliminary documentation to attempt to obtain funding will be prepared. Upon admission to a Ph.D. program, this will be the basis for further educational endeavors. To formulate these documents in a manner that expresses the actual needs of the

clientele and the organization while also informing what assets the organization has access to provide its clients, it was necessary to spend time observing the clients, staff, and resources of Southern Nevada Adult Mental Health Services; obtaining this knowledge was integral to the creation of the overall R03 application product as well as towards the goal of obtaining relevant data to understand the problem this research aimed to address. The R03 grant will enable the funding of research necessary to support such programs as the NEW-R program within this client population so that its efficacy can be demonstrated. The completed, funded research will seek to provide answers not only to how effective this program is in treating SMI and obesity but also to how clients' satisfaction with the program is influenced by their support and barriers to success, their satisfaction with the program, as well as whether caregiver training on nutrition and exercise might affect intervention results and effectiveness.

This project was determined to be necessary based on informal assessments and a literature review. Based on the results of a literature review, it is evident that there is little evidence to support interventions that target both SMI and obesity simultaneously. Very little research has been conducted on a large scale in this area, specifically targeting obesity in people with SMI. As occupational therapy professionals, more research is needed because their work requires evidence to support the application of a technique, program, or tool. This capstone project aims to provide practitioners with literature that can be cited to suggest effective treatment methods for clients.

For a well-informed grant application, collecting information at the point of origin, within the community, or in a setting where clients of the target population are currently served is imperative. Engaging with the population may provide insight into where services could be improved. A clearer understanding of how clients need support may also become apparent. As a

result, it may become more apparent what information needs to be included in the NEW-R research. This information would enable clinicians to provide patients with informed, evidence-based, and comprehensive treatment. To gain such knowledge about the target population of this capstone project, namely adults with SMI and comorbid obesity, those receiving services at Southern Nevada Adult Mental Health Services provided a basis of understanding and experience with which the grant application will be constructed. Because this population receives services in a facility that often treats underserved populations, this project aimed to address their unmet needs for services related to obesity and SMI by gathering information to support a grant application.

The fact that many clients within the target population are also residents of group living homes should also be noted. Due to their living arrangements, clients may have limited choices in their day-to-day lives as well as limited incomes, which may increase their risk of obesity due to the necessity of careful budgeting to provide food for themselves over time, as well as a continuation of SMI symptoms due to a limited number of resources, space, and time available to engage in meaningful activities that may reduce the symptoms. For this reason, it was critical to examine whether the NEW-R program was effective in bringing about these changes during the 8-week cycle, as it provided an effective functional treatment option despite these constraints. Through these means, occupational therapy may understand how to influence change under these conditions by finding the answer to this PICO question. As a result, this population may benefit from improved treatment.

Literature Review

Afzal et al. (2021)

Prevalence of Overweight and Obesity in People with Severe Mental Illness: Systematic Review and Meta-Analysis

This article was written to summarize data pulled from sources as a part of a systematic review and meta-analysis of research investigating obesity within the SMI population. The study aimed to identify the prevalence of SMI by its type and the region within which individuals with these conditions reside, as well as assess the risk of obesity within SMI populations compared to the overall public. The authors of this publication utilized various databases to extract data on the matter, and the publication's co-authors assessed the validity of the information gathered. This study utilized data gathered from over 100 studies rendered globally. It was found that the prevalence of obesity within the context of the SMI population was approximately 25.9%, indicating a genuine risk for this population.

Furthermore, it was found that when considering the category of 'overweight' and obese, the prevalence increased to 60.1% of the target population. The authors concluded that with this significantly higher rate of obesity in this population, it is likely that this also increases the risk of physical health complications and the rate of mortality. To remedy these risks, the authors suggest that clients would likely benefit from interventions to mitigate obesity within the SMI population.

The authors of this article were meticulous in their work to ensure that a wide range of SMI diagnoses were accounted for in the articles they selected to include within their meta-analysis. This article was included because their information was taken from various regions and with a varied mix of participants, allowing the information to be generalizable to the overall population. Regarding this capstone project, the article provides information that supports the

notion that there is a need for interventions that address obesity within this population precisely because of the number of individuals affected by it within those with a diagnosed SMI. The authors indicate a need for tailored programming to screen, address, and reduce obesity in this population. By supporting the NEW-R program through trial within a sample population, this intervention may serve as an option to address the gap in services highlighted by this systematic review.

Álvarez-Jiménez et al. (2008)

Antipsychotic-induced weight gain in chronic and first-episode psychotic disorders: a systematic critical reappraisal

This article aims to reappraise the actual effect of antipsychotic medications on weight gain in clients with SMI. Through assessment of the current literature on the topic, the authors of this article looked specifically at the most prescribed antipsychotic medications between two classes, including Olanzapine, Risperidone, and Haloperidol. Their arguments considered the cases of clients under both chronic and first-episode use of these antipsychotic treatments to identify if there were differences in the side effects based on current literature within both areas. The authors found that the effect of weight gain was dramatically higher within young clients experiencing first-episode psychosis treatment by three or four times that of chronic clients. However, it is essential to note that weight gain was prevalent among both populations. The authors of this article were meticulous in their selection of articles which yielded a critical appraisal that was sound in its arguments and holistic in its focus to support the fact that weight gain does occur with antipsychotic treatment regimens. In recent studies, the authors found that up to 80% of clients that utilize these treatment types experience weight gain and often decrease the well-being of clients with schizophrenia, especially regarding physical health factors. The

authors report that this weight gain tends to be the most challenging for clients due to its impact on their self-image, leading to isolation within the population.

This article helps support the notion that antipsychotic medications are genuinely a component of weight gain within the SMI population. If the client is seeking treatment for SMI, these pharmaceutical means are the gold standard and are generally prescribed, which makes the likelihood that an SMI client is, in fact, at risk of weight gain. The NEW-R program, which aims to induce weight loss, will thus satisfy the need of the client, given that they may require chronic usage of these medications. This is because stopping antipsychotic medications or medical noncompliance can lead to the relapse of symptoms. This fact further supports the notion that increasing the number of healthy habits an SMI client has may help them improve their overall well-being while targeting the weight loss goal for achieving a healthy BMI.

Avila et al. (2015)

An Overview of Links Between Obesity and Mental Health

The authors of this article identify parallels between those diagnosed with SMI and obesity and identify key concerns of each diagnosis separately. Through their analysis of these health concerns, the authors provide evidence for associations between the two conditions and the risk that this presents for those diagnosed with both. In addition to discussing the current evidence which supports the assertion that a link between the two disorders exists, the article also presents information on the pathophysiological mechanisms that may account for the association and some of the options for treating these conditions. The article thoroughly presents information within the current literature, providing evidence for the well-documented bi-directional link between the conditions, which helps to support the basis for this Capstone Project. The authors support the notion that obesity is related to various SMI diagnoses, which supports the generalizability of the information presented while again widely supporting this project.

Regarding the benefit of support for this Capstone project, the authors of this article assess the risks associated with obesity, which include "increased mortality and comorbidities such as hypertension, dyslipidemia, diabetes mellitus, coronary heart disease, congestive heart failure, stroke, gallstones, osteoarthritis, sleep apnea, and certain types of cancer, impaired fertility, and increased pregnancy risks" (Avila et al., 2015); this assertion helps to drive forward the concern of obesity as a global health risk for the population as does the article's assertion about the associated healthcare costs with the disorder. Similarly, the authors bring forth the disease burden associated with SMI, mentioning that it is the fifth leading contributor of burden, thus assisting solidification that it may pose a disability risk to diagnosed individuals. The authors utilize sound reason and provide adequate evidence to support the statement that one or both conditions may be debilitating. Hence, viable treatment options that reduce the prevalence of these conditions are needed within modern healthcare.

Begdache et al. (2021)

Diet, Exercise, Lifestyle, and Mental Distress among Young and Mature Men and Women: A Repeated Cross-Sectional Study

This article analyzed the differences in lifestyle choices, such as diet and exercise habits, among two age populations of men and women to understand the correlations between these factors and mental distress. To understand if these correlations exist solely from personal factors or if some extrinsic factors were involved, such as geography or time of year, the authors also recorded data on these conditions. The authors found that distress tended to be higher among young adults and women. The data indicated that consumption of fast food and caffeine tended to be correlated with higher scores of mental distresses among participants. Regarding this Capstone Project, this information is of note given that the clientele within the Experiential Site

tend to be of lower socioeconomic status and thus may be more commonly partaking in fast food consumption than other demographics. A strength of this article to note is the comprehensive list of factors the authors considered that were accounted for throughout the study to extract reliable data about participants. This article concluded that to improve mental well-being, it is recommended that individuals consume a nutritious diet as well as engage in regular physical activity.

This article is paramount to the argument for interventions such as the NEW-R program due to its attention to highlighting changes that clients may be encouraged to make with their daily routines associated with diet and exercise. One critique that may be made about the article, which weakens the arguments of the findings overall, is the fact that the authors attempted to hand-select some confounds to address but not others and provide little reasoning for the factors they selected to collect data on; this to some degree distracts from the authors' points. Regardless, however, the article was successful in its attempt to identify concerns across various demographics, which supports the generalizability of data found within the article. By utilizing lifestyle-redesign principles to bring about meaningful change for the clients in their everyday lives concerning how they eat and engage in physical exercise, the NEW-R program may help support the target population more effectively than current interventions aimed to address individual concerns of mental well-being and obesity. This notion indicates how the findings of this article support the underpinnings of this Capstone Project.

Bradshaw & Mairs (2014)

Obesity and Serious Mental Ill Health: A Critical Review of the Literature

This critical literature review analyzed research that identified the reasons, concerns, and associations between those with SMI and obesity. The author has found that current literature supports the notion that those with conditions such as schizophrenia are at increased risk than the

public to have risk of obesity as well as related metabolic disturbances such as diabetes and cardiovascular diseases. The research indicates a reduced life expectancy, up to 25 years, among this population. The article itself appears sound in its reliability and validity. However, the discussion of its inclusion and exclusion criteria seems to be weak; understanding this on a deeper level may have helped to understand the scope of their review better, but overall, the authors were comprehensive in their attempt to understand the true scope of influence that SMI status has concerning obesity. Overall, the article is successful in arguing that there is a need for more research to assist clients that may have a chronic need for these medications to work towards weight loss through other treatment means.

The utility of this critical review to this Capstone Project is unobjectionably given that the author's highlight information echoed across other critical analyses of associated topics. The authors of this article provide many of the statistics from the reviewed research that help to solidify their points which in turn helps to support the assertions that provide scaffolding for the creation of the grant application due to their ability to indicate the severity of associated concerns with obesity. Furthermore, this Capstone Project addresses the implication made by this article, such that more research must be done to improve the efficacy of modern clinical practices and serve as an effort in the attempt to illustrate that functional, client-driven changes to daily life may help to improve physical and mental conditions that may be possible without the use of pharmaceutical interventions which may be costly or compromise the health of the client in other manners.

Conn et al. (2019)

Occupational therapy intervention addressing weight gain and obesity in people with severe mental illness: A scoping review

The assertion that individuals with SMI have a higher rate of obesity than the public is supported by this scoping review. The authors selected to do a scoping review due to the limited amount of research that is accessible about the topic, which is supported by findings for the Capstone Project and thus increases the validity of both claims between this manuscript and within this article. The authors thoroughly explained methods and defined the actions and concepts they reviewed, indicating the reliability of the review. The authors remained meticulous in researching the topic, obtaining information across databases, and utilizing an exhaustive list of key terms to find the literature they sought. They completed this process over some months, indicating that the condition of scarce literature was stable, and the need for increased research remained constant throughout their process.

Regarding content, Conn et al. identify some of the reasons for the disparity, including some of the factors that NEW-R focuses on resolving. These conditions include poor nutrition, lower physical activity, and the side effects of medications meant to treat their SMI symptoms. The article calls out that evidence from other research that has been completed indicates efficacy in the case of lifestyle-based interventions. Given that the NEW-R falls within this category, the current literature supports the premise for research to understand further this specific intervention to create a more robust offering of intervention choices for addressing client needs. The authors of this article address the fact that currently, there are no publications that synthesize current literature on occupational therapy-based lifestyle-based interventions for addressing obesity. The authors compiled 14 articles within the review, and the consensus inferred from the research revealed that these interventions utilized the support of occupational performance and participation through four key areas. These themes can be applied to the NEW-R intervention curriculum and the focus on occupational performance from these programs.

These findings help to support the basis of knowledge for which the theoretical framework and frame of reference were deduced for this Capstone Project. The Canadian Model of Occupational Performance and Engagement marries with the ideas that the authors present, given that it focuses on ensuring individualized, client-centered care and addressing the "just right challenge" for the client while helping them to regain autonomy and the ability to employ choice while solidifying healthy lifestyle changes. The authors were thorough in their scope of considering articles for review, and the small number of obtained records echoes the problem this Capstone Project also aimed to address, such that there is scant literature to support these interventions; therefore, strengthening the evidence base is of paramount importance to the field of occupational therapy overall.

Chronister et al. (2015)

The Meaning of Social Support for Persons with Serious Mental Illness

Interventions that target habit creation or change often require external cues or support that assist the client in making the desired changes to obtain a successful outcome and maintain sustainable results. This article identified that social support in cases where the interventions were used with individuals suffering from SMI tends to represent highly functional support to succeed. The authors utilized a qualitative approach to uncover the information they sought and obtained information highlighting social support that clients found meaningful and relevant. One identifiable area for improvement of the study's methodology is that participants were from a socioeconomically stable and urban area which may hinder the generalizability of the data collected. However, although the information gathered may not always be generalizable, this article is of moderate reliability, given that the authors thoroughly interpret the data. This helps to contextualize their results, and therefore, it can be deduced how these results may compare to others within a similar target population. A strength of this study is that they defined the context

of the support being received and how it relates to SMI specifically. Therefore, it is clear that the implications were gleaned with an objective basis for understanding the communication.

The information from participants in this article reflects the information that others in the same position may experience and identifies the needs with which the client requires support. It also identifies who and how that support is obtained. Understanding this information and contextualizing it to inform better how clinicians can best partake in these roles and how to delegate best or encourage clients to utilize outside social supports is what makes this article highly useful in the context of this Capstone Project. Overall, the article is thorough and provides reliable findings with high transferability based on the contextualization of the statements and topics addressed by interviewers.

Fernández-San-Martín et al. (2013)

The Effectiveness of Lifestyle Interventions to Reduce Cardiovascular Risk in Patients with Severe Mental Disorders: Meta-Analysis of Intervention Studies

This study argues that SMI clients have a higher prevalence of cardiovascular risk factors than the general population. This study aimed to identify if modifications to lifestyle produced reduced concerns for those who engaged in such treatment. The authors conducted a meta-analysis that spanned 26 selected studies. From those, it was reported that such interventions did decrease risks for these clients. The rigor of this meta-analysis was high as the authors utilized several databases and reviewed studies published throughout the history of the database. To support the reliability and validity of their methods, the authors utilized triangulation to ensure that discrepancies were resolved before proceeding further. The authors' data provide adequate details from all studies included in the meta-analysis.

The importance of this work to this Capstone Project is to help support the notion that physical risk factors for clients with SMI and obesity can be effectively mitigated by lifestyle-

based interventions that can be utilized to bring about lasting changes from the client which in turn result in the reduction of new or chronic healthcare conditions. By strengthening this point, the goal of strengthening an intervention that may be utilized as a future best practice is likely and strengthens the argument for such research to be completed.

Hajek, Kretzler, & König (2021)

The Association Between Obesity and Social Isolation as Well as Loneliness in the Adult Population: A Systematic Review

This article aims to indicate that within current literature, the assertion that obesity increases social isolation and loneliness within the adult SMI population is supported. This article can be found to be of moderate reliability and moderate rigor when considering the authors' methods to obtain their results. The weakness of the article comes from the short list of databases that were reviewed and the brevity with which they described the specifics of their methods. The systematic review yielded six articles included in the analysis, which provides little of a holistic base for understanding the gravity of their assertions about the population.

Regardless of the moderate rigor, this article supports the notion that there is still currently a vast gap in current knowledge and understanding of the mental health implications of obesity, and therefore additional research is needed to better understand the needs of the clinical population. This Capstone Project aims to craft the outline and the means to obtain funding to answer the call to action the authors put forth by providing an opportunity for additional research to take place. Therefore, this article supports the notion that the outcomes of this Capstone Project are needed and supported by modern literature.

McIntyre et al. (2013)

Obesity and Mental Illness: Implications for Cognitive Functioning

This article aimed to indicate the cognitive repercussions of SMI and obesity. The authors completed a review of databases, and articles were considered for inclusion dating as far back historically as 1980. The rigor of the review was high; the authors were clear in their methods of cross-referencing keywords to obtain relevant documents, and the reliability of the information was high based on the assessment of their findings and the consistencies found within the articles chosen for inclusion within the review. The authors found that there was consistency among the articles that assert the notion that is a disproportionate overall burden of disability among these individuals that is brought about by their deficits in cognitive performance. This assertion supports the idea that the literature supports increasing access to evidence-based treatment options that prevent and treat these conditions.

To address the needs of the target population and reduce cognitive impairment brought about by comorbid SMI and obesity, it is crucial to treat and prevent further health detriments from developing because of the conditions. By managing these conditions through lifestyle means, such as NEW-R, the clinician may not only be addressing and improving perceived disability but may also be increasing improvement to cognitive state that may be measured by quantitative means providing more robust evidence to be obtained from such a study on programming like NEW-R with the target population.

Pyatak et al. (2022)

Optimizing Occupations, Habits, and Routines for Health and Wellbeing With Lifestyle Redesign®: A Synthesis and Scoping Review

The authors completed a synthesis and scoping review of current literature on lifestyle-based interventions to support the notion that these interventions are potential emerging best-practice for chronic disease management across clinical and community settings. This article was thorough in its review of current literature on the subject and had a high level of rigor and

reliability, as evidenced by the cross-referencing of material across databases that are general and specific to occupational therapy. This synthesis also provides evidence for why occupational therapists best administer such practices and supports their expertise related to occupation and functional abilities.

By including this article within the supporting literature for this Capstone Project, there is a basis for supporting lifestyle-based interventions as opposed to other methods for achieving the aims of the proposed experimental study. The authors clearly state and define that these types of interventions maintain a crucial difference from other approaches such that they maintain fundamental importance on regularly performed activities, habits, and routines. Doing so creates a basis of understanding as to the innovation of this Capstone Project and the proposed experimental study that may follow the completed R03 grant application submission process.

Shrivastava & Johnson (2010)

Weight-Gain in Psychiatric Treatment: Risks, Implications, and Strategies for Prevention and Management

The authors of this article review literature discussing the concern of weight gain among clients diagnosed with SMI. The specific factors they look to obtain information on include the side effects and implications of antipsychotic medication treatment for clients. The assertions herein that the authors make based on their findings are such that clinicians must consider the risks and take precautions as well as monitor their client's weight conditions as they take their prescribed medications and consider the risks and benefits of maintaining the course of treatment. The authors of this article identify factors that may impact a client's susceptibility to such weight gain as well as the mechanisms associated with the process. The author's approach to the topic indicates high rigor as they examine an expanse of conditions associated with the

addressed topic and include methods for managing the concerns based on the mechanisms inducing them.

The relevance of this study to this Capstone Project is that the authors strengthen the assertions that there are effective methods of managing the weight gain associated with these treatments and support the fact that doing so is a possible and necessary responsibility of psychiatric and mental health-associated practitioners. Thus, projects that bring about information about practical and accessible interventions are supported by the topics addressed within this article.

Waite et al. (2022)

The psychological journey of weight gain in psychosis

The article addresses the topic of weight gain as it is associated with antipsychotic treatment for SMI. The authors seek to identify the interactions between physical and psychological consequences of weight gain and their implications for intervention options for treating SMI. This study's rigor is moderate due to the investigator's choice to utilize a qualitative design due to the subjectivity of the information obtained from semi-structured interviews. However, the authors employed high internal validity by utilizing sound analysis of their collected data, which allows the findings of this research to be reliable and valid for the functions of supporting studies that may result in additional intervention options for clients attempting to reduce their weight following implementation of antipsychotic medication treatment interventions. The authors found that with the weight gain associated with such treatment options, clients were often impacted in areas that may impact their mental health symptoms, such as motivation and self-image, as well as their agency and motivation to improve their overall physical and mental well-being.

Based on the assertions made by the author, it is possible to utilize the findings of this study to strengthen the argument that clients still need intervention options to mitigate weight gain associated with current best practices for the treatment of SMI. By evaluating and proving the efficacy of non-pharmaceutical interventions such as lifestyle-based interventions, clients may be able to be offered an alternative or supplement to such treatment options, which will, in turn, promote their autonomy and agency to be a part of their treatment and care decisions. Allowing clients to partake in the process in such a way supports the client's worth and dignity, as is a paramount objective of occupational therapy interventions. Furthermore, addressing weight gain and obesity as potential catalysts for worsening mental health symptoms ignites a consideration of the effectiveness of antipsychotic treatments. Mood changes and cognitive shifts may impact some symptoms due to the client's obesity. This assertion provides a basis for expressing the seriousness of such a side effect and encourages efforts to find intervention options that successfully manage the concern.

Synthesis

According to the articles read and referenced, obesity and SMI are often interrelated. As Afzal et al. (2021) reported, "People with SMI have a markedly higher prevalence and likelihood of obesity than the general population." This may contribute to this group's higher prevalence of physical health conditions and mortality. The healthcare community needs to do more to address this issue since this population reaches a substantial number of people and is not effectively addressed. According to Afzal et al. (2021), "Interventions to reduce and prevent obesity would likely benefit people with SMI around the world." The article emphasizes that obesity and severe mental illness often go hand in hand. As a result, clients with these conditions are more likely to experience issues. Besides the obvious physical health concerns associated with obesity, Hajek,

Kretzler & König (2021) suggest that the stigma surrounding weight may also contribute to mental health problems such as feelings of isolation and conditions of loneliness. According to current research, weight gain is implicated in psychotic symptoms through experiences such as depression, social withdrawal, and concerns about self-esteem (Waite et al., 2022).

SMI treatment often involves medications that suppress mental and physical function to manage the patient's condition. Among these medications are antidepressants, anti-anxiety medications, antipsychotics, and others. To treat these disorders, patients may experience fatigue, become lethargic, have a lower metabolism, and experience other symptoms because of suppressing their body systems. As a result, individuals may gain additional weight or find it more challenging to lose weight. Alvaro-Jiménez et al. (2008) state that "up to 80% of patients who are treated with antipsychotics experience significant weight gain. Weight gain adversely affects the clinical outcomes and well-being of schizophrenia patients". Although schizophrenia is only one type of SMI, these findings are associated with the side effects of antipsychotic medications, and these medications may be used to treat several different diagnoses and symptoms. The effects of psychotropics, such as antidepressants, on weight gain are like those of other psychotropic medications. As a result, individuals being treated for SMI are more likely to experience associated weight gain (Shrivastava & Johnson, 2010). Considering that many clients with SMI suffer from symptoms that can be debilitating and must be managed, it is likely that this risk of weight gain needs to be mitigated without necessarily deprescribing the medication since its utility is so beneficial. This being the case, lifestyle changes that can be taught through interventions such as the NEW-R program may be considered an alternative or even preferred method of treatment if found to be effective.

Increasing weight can lead to higher medication dosages and a more complex medication regimen from a medical and pharmacological perspective. In addition, it may result in physical injuries and mental health issues. Per Conn et al. (2019), clients with SMI are often prescribed many medications; this, as well as the condition of obesity, may increase the population's mortality risk. For a client with SMI and obesity, it may make sense to focus on solutions that reduce the need for some of the medications that the client is currently prescribed; to accomplish this, it may be necessary to intervene with client diagnoses in other ways. In the case of obesity and SMI, clients may have good insight into their conditions.

Furthermore, they may wish to make lifestyle changes to improve their health. In addition to improving their medical well-being through proven therapeutic interventions, clients may be provided with additional autonomy and the opportunity to consider reducing the number of medications they must take, experiencing overall symptom relief, and improving mental and physical health conditions by receiving assistance from proven therapeutic interventions. As a result of supporting the implementation of the NEW-R program, a population with limited resources may be able to access simple changes that will increase their level of autonomy, control, and education to make better-informed decisions about their health.

The topics of the literature mentioned above outline the underlying needs of the population that will be impacted should the grant application be approved. Regarding those with SMI and obesity, it is evident through the research that there are few complete and effective treatments to mitigate weight gain that may be linked to SMI through medication interventions, predisposition, or other factors. This serves as the premise and calls to action for research such as this Capstone Project, which aims to address this gap in modern medical care. Among the literature that influenced the decision about which grant to apply for, according to the National

Institute of Health (2022), the R03 grant has the most apparent alignment with the research needs. This research aims to establish a preliminary basis of understanding within the field and a fundamental body of knowledge. Due to its suitability for small, self-contained research studies, the R03 grant is typically applied for in these cases. Approximately \$50,000 is available for a two-year research project under this non-renewable grant. NEW-R can be implemented in eight weeks, which allows ample time for running trials, completing additional research tasks, and seeking feedback from the partnered organization and clients.

Statement of Purpose, Hypothesis, and Research Question

This project aims to determine the feasibility of a research question that will lead to a completed R03 grant application. As a result of this grant, future research in the target population of adult clients suffering from SMI and obesity will be funded. Specifically, this research will support the NEW-R program, which aims to provide resources and educate clients about nutritional choices and how to incorporate exercise into their daily lives. With the help of both skills, I aim to help clients achieve weight loss and improved physical health. Additionally, it is my objective to utilize the same information to reduce the symptoms of SMI for these individuals simultaneously.

Using NEW-R as a therapeutic intervention, it is hypothesized that clients may experience a decrease in their BMI and symptoms of mental illness. Additionally, occupational therapists will gain a greater understanding of how to use such programming and will be able to implement such treatment interventions more effectively with their clients who have obesity and SMI diagnoses. As part of this capstone project, experiential learning will be used to answer the PICO question in the following manner:

In clients with a serious mental illness (SMI) diagnosis who have comorbid obesity, how effective is the NEW-R program in pursuing a healthier BMI and reducing symptoms of SMI as demonstrated by qualitative self-report and objective numerical reductions in BMI as compared to no intervention when it is implemented within an 8-week period?

As a result of experiential learning at SNAMHS, as well as creating the opportunity to obtain funding that will support additional research about the effectiveness of the NEW-R program, this capstone project intends to enhance the field of occupational therapy overall by

contributing to the development of a body of foundational research that can be used by practitioners and clients alike.

Theoretical Framework

The Canadian Model of Occupational Performance and Engagement serves as the theoretical framework for this program. The Canadian Model of Occupational Performance and Engagement (CMOP-E) is a model based on occupational performance. The CMOP-E is an evidence-based model that considers the factors that influence performance in any given activity. It recognizes that internal and external factors, such as physical, mental, emotional, and social factors, can affect an individual's ability to perform an occupation. It also emphasizes the importance of engagement in the activity and the relationship between the individual and the environment. This framework includes person, environment, and occupation components while considering spirituality. This spirituality piece sets this framework apart from others and speaks to what motivates the client to move forward. This framework was utilized to ensure that the client can effectively utilize what they learn during NEW-R training in ways that are meaningful to them. Understanding the client's spiritual beliefs and incorporating them into the framework helped provide a holistic approach to better understanding their needs and how to use the knowledge gained from the training. It also allowed them to connect their spiritual and physical, and mental goals to achieve a more meaningful result. Understanding on a deeper level the client's motive for making diet and exercise changes via consideration through the lens of the CMOP-E made individualizing the sessions through tailoring educational materials to suit their home situations more accurate. Additionally, utilizing this lens helped to address what exercises and encouragements to participate were most effective and satisfactory to the sessions' participants. The CMOP-E is foundational to this project since diet and physical activity habits are so deeply tied to a person's experience of life through means of culture, location, ability level, age, as well as other client factors; by considering the motives and reasons that a client engages

in occupations related to food and exercise, the clinician may be better able to provide client-centered intervention and habit changing suggestions.

Frame of Reference

The program's frame of reference (FOR) is the Rehabilitative FOR, which emphasizes the importance of facilitating the participation of patients in recreational activities and engaging in social activities with competence. This FOR focuses on the individual's ability to gain the skills they need to function in their daily lives and helps them to increase their independence and sense of self-worth. It also emphasizes the importance of creating an environment conducive to learning and growth. This frame of reference considers permanent or semi-permanent impairments and uses compensatory strategies and other means of engagement to allow clients to participate in their daily occupations. In the context of SNAMHS clients, one of the permanent conditions is the modification of their independence. This is partly because many of these individuals reside in group homes. As a result, their daily choices may be limited, and their socioeconomic status may be permanently reinforced. For instance, many clients cannot establish a bank account or move out of their group home due to the lack of independent living skills, leading to a permanent state of dependence. As a result of a lack of autonomy and decision-making capacity, these conditions may increase the risk of obesity and mental health problems.

Methodology

Due to the nature of this Capstone Project, the methodology herein describes the study that *will* take place following the approval of the R03 grant application. To outline the specifics of this study, the methodology crafted for the R03 document is included in this section. Aside from a preliminary description of the methodology for a future study, the methodology employed for the creation of the R03 application in and of itself included pairing with SNAMHS and observing client services alongside the providers that work within and affiliate with the facility such as Boulder City Partial Hospital Program (BCPHP). During this affiliation, time was spent observing home visitation, group meetings, and appointments with clientele at the facility. To find interested clients, flyers were handed out to case managers in the facility, and the clinicians made individual referrals. At that time, the client was briefed about the program and allowed to participate. Once three participants were motivated and requested participation, the sessions were held over eight weeks. During appointments set up with clients who could retain reliable transportation, one-hour meetings were held in which the sessions of NEW-R were run, and clients engaged with the material. Each week, clients were asked to complete in-person and at-home activities, provide verbal feedback about their goals and success in working towards those goals, and provide feedback for the materials and lecture portions of the intervention. Following the close of the eight-week sessions, clients were encouraged to retain their materials to review and utilize at home to further their goals. The data gathered during the Capstone Experience for creating this manuscript and the accompanying R03 grant application (Appendix B) were obtained through nonspecific measures via client interviews, clinician interviews, and observations made via time within the facilities.

If the R03 grant application is approved, a similar approach will be taken with the program's implementation with clients. All necessary materials would be procured, including leader and participant manuals, writing utensils, session-related materials, local grocery store advertisements, exercise tools such as handheld weights, nutrition labels, and notecards for clients to complete goal-writing activities. In addition to these materials, data collection instruments would be gathered, including a scale and tape measure, the Visual Analog Mood Scale, the General Health Questionnaire-12, Canadian Occupational Performance Measure, a blood pressure cuff, a pulse oximeter, and a glucometer. Once these materials were obtained, a designated area of the facility would be reserved for the sessions to be run weekly for two hours each time. These two hours will allow time for the reception, running the session, and data collection weekly. Data being collected would include blood pressure, client weight and height, calculated BMI, voluntary food logs, hand-written goal sheets, blood sugars, blood pressure, heart rate before and after exercise, and results from assessments and surveys as given before session one and following session eight, and ongoing feedback from clients throughout NEW-R sessions. Following the NEW-R session completion, the investigative team would analyze collected data via paired t-tests to ensure that the NEW-R sessions experimental group obtained improvements compared to the results of the control. After collecting the data, all information would be deidentified to maintain ethical responsibility to mental health clients. Following de-identification, the investigative team would make conclusions and recommendations based on the results and present the data.

The design of this study would be a true experimental design to understand the long-term impact of learned material while involved in the program and the prospective future results of the clients. Given that the variables may be independently measured from one another this helps to

streamline data analysis and obtain both data points simultaneously. The design will also include a pre-test/post-test design to understand baseline measures and change from baseline, hopefully supporting the hypothesis by indicating a reduction in BMI as well as an improvement in mental health symptoms. These design choices were selected due to the brevity associated with pilot studies completed under an R03 grant application due to the non-renewable nature of such funding, thus leading to a need to ensure there is spare time to make sure data analysis and presentation of findings are well organized without worry that funding or timing will run out. Selecting participants for a sample will include ensuring that those participating in the study have a BMI of 25 or high to indicate a level of obesity as well as having a professional diagnosis of an SMI. The study participants will come from referrals by the client's case manager, psychiatrist, or general physician to ensure they fit the requirements appropriate to test the hypothesis. The advantages of sampling in this way are that the participants will be identified as fit to participate by clinicians who will be able to assess their likelihood to remain in attendance and participate, as well as ensure that the clients participating are motivated and have voiced a desire to lose weight or want to make improvements to their mental health status which supports client-centered interventions that occupational therapy is grounded in. The disadvantages of this type of sampling are that it may be susceptible to a level of bias by the practitioners making the referrals. To protect against these concerns, the investigative team will randomly select clients to participate as a control group and part of the treatment group. It is important to note that clients, as part of the control, will be offered the NEW-R materials following the trial should they desire access to such treatment if proven successful. To ensure the study's validity and associated data analysis, triangulation will occur with client satisfaction measures such as surveys and interviews. Regarding quantitative data, all assessments will be from well-accepted and

rigorously studied sources to ensure all measures are sound within the study. Following the data collection, clients will debrief and be dismissed from the group sessions.

To understand the benefits of the NEW-R program as an intervention option for SMI individuals, the program must be run through its course, allowing for data to be taken and analyzed. This will allow the investigative team to provide best practices for utilizing this intervention with individuals pending IRB approval. The study will be utilized to highlight results that support the notion that utilizing healthy habit changes for those with SMI and obesity will be more effective than other interventions currently recognized as best practices for these conditions. **The overarching goal of this study would be to support that the NEW-R program effectively reduces BMI and reported symptoms of SMI for individuals with co-diagnosed obesity and SMI.**

Population and Agency

The sample population for which the program will be run will be obtained through the clinicians within Southern Nevada Adult Mental Health Services from their current clientele. Southern Nevada Adult Mental Health Services is a state-run institution that provides outpatient needs for clients seeking psychiatric and mental health support, such as psychiatry, case management, pharmacy, clinical psychology, residential help, and more. The agency is affiliated with many local group homes, providers, and Rawson-Neal inpatient psychiatric treatment. Many agency clients are uninsured or insured by Medicaid or Medicare. The agency's clients are a mix of individuals who are court-mandated to be under the agency's jurisdiction or voluntarily receive treatment. The data obtained from these participants will record necessary quantitative data such as attendance, weight, BMI, diabetic status, and overall health status, as well as qualitative data such as individual satisfaction,

critiques, and comments on program implementation. To obtain a pool of participants, Southern Nevada Adult Mental Health Services clients will be invited to take a survey to identify eligibility for participation. To ensure that the voluntary participant sample group suits the target population, eligible participants will be included on the basis that they have a diagnosed SMI and, upon beginning the program, have a BMI score of >25 , indicating obesity; this will help to ensure the validity of the information obtained. Once participants have been selected and consented to be part of the trial, a survey will be administered to understand the person's current habits, everyday activities, goals, and current knowledge about health as it relates to nutrition and exercise. Following the trial, another survey will be completed to identify changes to the individual's habits and goals, identify achieved goals, and identify what new skills or information the participant could take away from the provided programming.

Material and Supplies

To run the NEW-R program, the necessary supplies and materials consist of the leader and participant manuals, composition journals, writing utensils, necessary paper assessments, a tape measure, a blood pressure cuff, a pulse oximeter, a scale, one computer per investigative team member, a television, and a printer/copier. Regarding facilities, to run this study, it is necessary to have access to a group room large enough to house the group, chairs, and tables, and access to a second room or waiting room for participants to be held while private health information or discrete data may be taken.

Plan of Action

The NEW-R program utilizes an 8-week course with material that spans nutrition and exercise topics while challenging the participant to set and maintain goals related to the

material weekly. In addition to this data, the investigative team will collect and maintain records of individuals' body weight, blood sugar, and blood pressure at the beginning of each group session with informed consent, which will be indicated via an informed consent form before the start of the study. In addition to these metrics, individuals will be asked to keep a food diary privately shared with the investigative team and voluntarily within the group, which will be up to the individual's discretion. Each session will also include a 20-minute exercise activity and data on participation and experience will be recorded to understand individual compliance with the NEW-R program. The collected data will include pre-test/post-test information that will be statistically analyzed via paired t-tests against a control group that will later be provided the same intervention. The data compared will include weight, BMI, blood sugar, blood pressure, blood oxygen level, and data obtained from the Visual Analog Mood Scale (VAMS). This analysis method will provide insight into how well this intervention reaches the two defined aims compared to no treatment to prove the intervention is an effective method of achieving weight loss and symptom improvement for individuals who are not otherwise able to achieve this goal.

By comparing the NEW-R program against no intervention, it will highlight the fact that the influence of NEW-R on diet and exercise habits as well as cognitive reframing taught within the group lectures, will result in a lasting improvement in these areas of well-being for the individual on a quantitative basis such that BMI will reduce. The number of days or severity of experienced SMI symptoms will decrease. The data obtained through qualitative means will occur at four points of the experiment; once before sessions, following session three, following session six, and finally, after the group's conclusion. Patients will be asked to share their thoughts about the intervention on the whole, their experience as it

relates to experienced mental health symptoms, challenges they faced during the group related to session content, what they found to be successful changes that they made, their social engagement with members of the group, and their sense of motivation to pursue the maintenance of the health habit changes they have made as it relates to session information.

Evaluation of Pilot Study Goals

AIM 1

Evaluate if the NEW-R program results in a reduction in Body Mass Index

BMI is a screening measurement that considers a person's weight divided by its square of height, helps to identify the mass of a person's body, and is a generally accepted tool for identifying one's weight category from underweight to obese (Centers for Disease Control and Prevention, 2022). BMI is a universally respected measurement of body weight that provides a means for medical practitioners to understand the results of the study that is respected within the medical community for reliability. Collecting the BMI of participants before and after the study will help to understand the success of the diet and exercise habit changes made by the individual relative to the reported goals and completed food diaries provided by the group participants. By comparing body mass changes to the initial value, it will be precise how effective the habit changes are regarding reducing BMI and indicate changes the individual makes after being provided with nutrition and exercises educational materials. It is expected that as the individual continues through the trial and after that, they will continue to increase healthy habits related to diet and exercise. Therefore, the study results will show a decrease in BMI for participants that were compliant with and engaged in activities provided during the trial of the NEW-R program.

Individuals with SMI and elevated BMI commonly have a myriad of factors that may lead to the elevated values reported. These factors may include the utilization of psychiatric medications that lead to metabolic disorders, medication noncompliance due to SMI symptoms such as avolition or forgetfulness, genetic predisposition, overeating due to symptoms or habit, chronic pain, and inflammation, lack of mobility, physical disorders, and more (Bradshaw & Mairs, 2014). To ensure that participants can be successful, these confounds will be addressed during pre-screening for participation and addressed during the first week of the program through means of providing medication compliance reminders, ensuring all diagnoses are under management and care by a primary care physician, and ensuring clients understand and abide by the demands of the study while completing the NEW-R program.

AIM 2

Evaluate if the NEW-R program results in the reduction of SMI Symptoms.

The NEW-R program encourages a healthy diet and exercise habits to be adopted by individuals with SMI. Aside from the physical benefits that can be achieved by adopting these habits, doing so will impact the person's severity and frequency of experiencing SMI symptoms (Begdache et al., 2020). This trial's goal is to quantify decreases in these symptoms as affected by the inclusion of healthy habits as demonstrated within the program. The benefit of this for participants is that it will allow them to reclaim autonomy and engage in more meaningful activities within their everyday life that changes the trajectory of their prognosis. It will also provide opportunities for the individual to practice independence through goal setting and making choices. Suppose the NEW-R program can achieve a

reduction in SMI symptoms for participants. In that case, they may be able to complete more ADLs and IADLs independently and reduce their psychiatric barriers.

Data will be taken before and after they undergo the trial intervention to understand whether improvements in this area occur for participants. The means for assessing a participant's performance of everyday tasks they complete that will be utilized in this study is the Canadian Occupational Performance Measure (COPM). Additionally, the General Health Questionnaire (GHQ-12) will be utilized to assist in the assessment of symptom severity for the client. This metric is a reliable and valid measure for obtaining information about psychological distress (Hystad & Johnsen, 2020). It will be utilized to understand the severity of the psychological symptoms program participants are experiencing at the time it is administered. It is expected that following the guidance of the NEW-R program and instilling healthy habits for diet and exercise will help to eliminate or reduce some of the experienced mental health symptoms that participants experience. By obtaining data from individuals on their perceptions of the program and their personal opinions regarding NEW-R and their experience with the material, the investigative team will obtain information on what will strengthen the intervention for individuals overall; this will be managed through self-report via interview and survey methods.

Ethical and Legal Considerations

A consideration for this study is that individuals with SMI are a protected class. It is crucial that the study and its results are conducted to ensure the rights and safety of individuals with SMI and that any interventions proposed by the study are conducted in a way that is sensitive to the needs of this population. Furthermore, the data should be analyzed in a way that respects the individuals involved and the privacy of their personal information. As a result, addressing the needs of individuals requires an emphasis on privacy, advocacy, and justice. When the data from the research is published, all information will be deidentified to ensure that these ethical concerns are upheld in a dignified manner for the individuals.

Additionally, all participants should be enthusiastic about participating in the program and provide their consent once they are informed of its objective. This is important because it ensures that the data collection process respects individuals' rights and allows them to remain anonymous while their data is being collected and used. It also ensures that they know of any potential risks associated with participating in the research and can provide informed consent. Regarding the limit of this capstone project, the goal is to create the documents needed to complete the research. There is no need for forms to be obtained by clients as there will yet be research participants utilized within the scope of this capstone project.

Results

This Capstone Project aimed to incorporate information gained from literature and information and observations made while completing the Capstone Experience into usable data to inform the creation of an NIH R03 Grant application. The data collected throughout the Capstone Experience was recorded through notetaking, informal interviewing, and in-person observations and provided insight into the viability of completing a study as designed and presented within the grant application. This goal was achieved, and the ready-to-submit deliverable is provided at the end of this manuscript. (Appendix B)

While completing the Capstone Experience at SNAMHS, the goal of providing a voluntary opportunity for clients to learn about nutrition and exercise through the NEW-R materials was offered; three clients consistently participated for the entire duration of the eight-week sessions which provided a basis of knowledge about interest in this type of group within the SNAMHS facility. (Appendix A, Table 1) Based on the information offered by clients who participated in NEW-R group sessions during the Capstone Experience, they successfully improved one or both aims to be assessed by a pilot study on this program. (Appendix A, Table 2) In all three participants over the eight weeks, clients reported that they improved their overall feelings of control, self-worth, and confidence, as well as reported an improved sense of competence with their knowledge of nutrition and ability to utilize what they had learned within the sessions. Furthermore, one client self-reported a weight loss of three pounds while utilizing the information and goal setting as instructed through the NEW-R materials.

Overall, clients reported being satisfied with their experience with the program and provided input on support and barriers to success. Regarding support, clients reported that utilizing social means of accountability and support helped them succeed through conversations

or planning meals with family or roommates. Conversely, clients mentioned that barriers to success that they experienced included low food budgets, dietary restrictions, and "bad days," which referred to experiences of increases in experienced SMI symptoms.

To conclude that a study on the NEW-R program would be viable and warranted, the collected data, completed a literature review, and observations were analyzed by considering current literature recommendations and implications compared against the clients' results and reports at SNAMHS. Given that the qualitative data supported the case for repeated utilization of the NEW-R program with additional clients as well as the request for additional or advanced iterations of material for the clients who participated in the sessions, it may be advisable to move forward with a pilot study that would capture both quantitative and qualitative information to support the efficacy of the NEW-R program.

Discussion

This Capstone Project was successful in its goals to obtain information about the mental health field within the context of southern Nevada. By spending time within SNAMHS and gathering the experience to inform the creation of an R03 grant application, the Capstone Project successfully provided a platform to achieve the goal, furthering the intervention options for occupational therapists working in the field of mental health. This Capstone Project foraged a path for which it is possible to complete the aim and materialize an even more robust evidence base for lifestyle-based interventions with the hope of improving client outcomes. The R03 grant application sets the premise for future research to take place with serious intention as the effort has taken place to provide evidence of the essential need for such studies to take place.

Through observation, experiences, and interactions with clients and the professionals within the agency, specific roadblocks may serve as a challenge for implementing such studies. However, by appraising the facility's resources and staff, resolving such concerns to allow for the best possible conditions to run a study on the NEW-R program is feasible through the appropriate process. Completing this Capstone Experience also served to highlight some of the overarching challenges that may arise while addressing concerns within clinics aimed to treat mental health, such as diagnoses-related risks and common client-practitioner challenges, the involvement of state and federal politics regarding treatment within state-run institutions, as well as practical usage of resources or finding additional resources when necessary.

One question that arose at the beginning of the Capstone Project and was considered while completing the literature review was whether SNAMHS was an appropriate venue for hosting such studies as is outlined within the R03 grant application due to the level of independence among clientele seen within the agency and the scope of practices within the

facility. With the proper support, SNAMHS would be a viable option to host a study organized and outlined within the R03 document. This notion is supported by literature as many other articles outline information collected from state and county healthcare establishments. Some of the steps that would help to ensure the successful completion of a research project aimed to identify whether or not an intervention like the NEW-R program is effective in reducing BMI and mental health symptoms within this clientele include establishing accessible means of transportation for clients, ensuring proper referral and advertisement of such a program, and securing a space within the facility that would allow for all aspects of the NEW-R sessions to take place including the exercise portion of the program.

During the Capstone Experience, it was identified that per client reports that the NEW-R program materials they were provided helped them to make healthy changes and provided a “just right” challenge. Anecdotally, one of the clients during the Capstone Experience reported that she successfully achieved weight loss, and another client reported a dramatic reduction in his mental health symptoms. These results assist with laying the groundwork for gathering an investigative team to administer this intervention via experimental study pending the R03 grant application approval and following the recommended changes within the target facility.

It should be noted that SNAMHS, as a governmental institution, does all it can to provide for the clients within its jurisdiction. However, following the COVID-19 pandemic, many services once offered within this agency are no longer provided. However, it would be necessary if investigators ran an experimental trial of NEW-R within the facility. Currently, SNAMHS does not have an occupational therapy department; establishing such a department is integral to running a program like this due to the professional practice occupational therapy can provide clients. This will allow for a more substantial research design.

Additionally, it is recommended that SNAMHS consider adding required group therapy attendance for their clients. This recommendation is based on observations made within the clinic such that clients need to be more reliable in their attendance, even for mandated appointments to obtain their medications which may be due partly to unfamiliarity with the clinic and lack of regular patronization by clients. Other professionals in the building also found it challenging to meet with their clients regularly, leading to stagnation of client progress and lack of improvement. These observations may be transferable to the experience of running an experimental study as outlined within the R03 application herein. To ensure that clients attend sessions reliably held for the trial, a requirement to attend may help to support the strength of results obtained from the study.

One of the strengths of SNAMHS that supports the proposed study is the layout of the facility, which allows for interdisciplinary communication between professionals within the building, ensuring continuity of care. In addition, many professionals who are experienced in the fieldwork at the agency have a rapport with their clients, which assists them in obtaining client buy-in to new programming and implementing practices that move the client in a positive direction toward set goals within their treatment plans.

In connection with the literature, this Capstone Experience provided insight into the field of SMI and currently accessible health care for these clients. As stated within the literature, there is a lack of accessibility to comprehensive care that is client focused. Additionally, among clients observed during the Capstone experience and confirmed through discussion with professionals within SNAMHS, there are serious concerns about the risk of obesity within this clientele. Most, if not all, clients receiving care within this facility are on a regimen of antipsychotic treatment. As supported by the literature, this may cause metabolic disruption in clients receiving care at the

facility, therefore leading to the risk of obesity as well as other physical and mental repercussions.

The results add knowledge to the theoretical framework of the Canadian model of occupational performance and engagement by supporting novel endeavors to create holistic lifestyle-based interventions for clients to achieve their goals as it relates to their physical and mental well-being while supporting them in a social setting and allowing them to employ the education they receive within their everyday lives. The CMOP-E Supports these endeavors by encouraging practitioners to view interventions as client-led experiences in which clients have the power and agency to decide what is important to them and show motivation to achieve said goals.

The connection this Capstone Project has to the American Occupational Therapy Association Research Agenda (2011) falls under the category of intervention research. Within the Centennial Vision, there is an understanding that intervention research supports occupational therapy as “a powerful, widely recognized, science-driven, and evidence-based profession” (The American Occupational Therapy Foundation, 2011). Therefore, engaging in research to strengthen accessible client interventions helps support this vision statement. Furthermore, preparation to allow such research through the medium of an efficacy study to be organized supports the premise of this Capstone Project, which seeks to inform treatment and effectiveness of current occupational therapy interventions by considering which factors of the program help to increase the client likelihood to create long-lasting, sustainable achievements and thus improving client outcomes.

Possible Limitations and Considerations

Clients within the target population typically reside in residential care or group homes, limiting their access to additional resources and their control over their schedule. For example, residential care staff often determine when clients will eat, sleep, attend medical appointments, and engage in leisure activities, significantly limiting their autonomy and sense of choice. This may hinder them from meeting their goals. As a result, it is crucial to consider these restrictions when developing interventions and supporting clients in this population. Empowering them by providing them with tools and strategies to maximize their autonomy and well-being is essential.

Furthermore, Southern Nevada Adult Mental Health Services does not mandate group engagement and attendance, so ensuring group commitment and attendance may prove challenging. The investigative team will perform several activities to mitigate these risks, including caregiver training and take-home materials reinforcing the information and instructions disseminated. Throughout the study, the investigative team will provide individual reminders and assist participants in obtaining reliable transportation.

Even though this study will be geared toward a particular population within an organization to be implemented, the results may be generalizable to other individuals who meet the same criteria and goals in other locations; in this manner, there is assurance that this study can be conducted in a wide variety of mental health settings. To ensure this, the study's results may be used to inform and enhance treatment for individuals in various mental health settings. The data will be analyzed to determine the effectiveness of the proposed interventions and provide evidence-based recommendations for clinical practice.

Conclusion

This Capstone Project aimed to utilize information from the Capstone Experience and a literature review of the topic, obesity within the SMI population, and currently accessible interventions to help strengthen the pool of existing evidence for implementing the NEW-R program for occupational therapy practitioners. The outcomes of this Capstone Project were a completed R03 grant application and a deepened understanding of the needs and accessible resources for SMI clients within the Metropolitan Las Vegas area. Through the Capstone Experience at SNAMHS, both outcomes were achieved. The need for this Capstone Project is backed by the literature and current best practices within the field, such that there is a gap in current interventions that effectively treat obesity for SMI clientele. This is significant to occupational therapy as all treatment of clients within the practice must be evidence-based and thoroughly assessed to ensure clients reach their full potential safely and by proven means. This helps to obtain achievable and measurable results that help with treating current conditions and preventing others in a client-centered manner; such is the goal of occupational therapy practice overall.

It is recommended that the R03 application is submitted, and the organized experimental study is completed to move occupational therapy practice forward and support interventions through research as outlined by the governing bodies of the profession. Following this study, further research is recommended to target associated concerns for SMI clients, such as reducing polypharmacy, increasing caregiver knowledge of healthy diet and exercise habits, as well as looking to increase BMI for those that may have SMI that led to being underweight. These following steps guide broadening research that helps develop or strengthen the proven efficacy of current interventions and helps to support clients struggling with SMI and associated

conditions to attain holistic, individualized, and dignifying occupational therapy care for their needs.

Appendix A

Table 1
Sociodemographic Characteristics of Participants at Baseline

	N	%
Gender		
Male	1	33.3%
Female	2	66.6%
Age		
40-49	1	33.3%
50-59	2	66.6%
Psychiatric Medication		
Yes	3	100%
No	0	0%

Note. N=3. Participants included completed all NEW-R sessions. Participants were predominantly Female. The mean age of participants was 55.0 YOA.

Table 2*Participant Satisfaction with Participation in NEW-R Group (N=3)*

Satisfaction Justification	Example Quote	Frequency, n (%)
Lost weight	“I really wanted to participate so that I can lose weight and fit my clothes better. I have lost three pounds and want to keep making progress”	3 (33.3%)
Nutritional Knowledge	“I think I know more about what’s in food so that I can make healthy choices for my meals”	3 (33.3%)
Improved overall health	“I have a lot of health problems and I think learning healthy habits has helped me work on them; like walking more and eating more leafy greens”	3 (33.3%)

Appendix B

R03 Grant Application

Abstract

Increasing numbers of people suffer from obesity and severe mental illness co-morbidly. If these conditions remain untreated, they can harm an individual's health and well-being. Unfortunately, there are very few programs currently available that target both management and improvement of these conditions simultaneously. Even so, despite the lack of programming options, the NEW-R program strives to reach those goals. Unfortunately, there isn't an abundance of studies that have been completed that support the effectiveness of this program or others like it. This poses a concern for modern medical professionals who hope to assist their clients in managing these conditions as treatments must be based on evidence. To build the knowledge base for practitioners and their clients, this grant application seeks to address this need by proposing a study which aims to identify the efficacy of the NEW-R program as it relates to the goals of decreasing BMI and experienced mental health symptoms within individuals diagnosed with SMI.

SPECIFIC AIMS

For individuals with concurrent obesity and Severe Mental Illness (SMI), there are scant options for effective management interventions. Many individuals diagnosed with SMI suffer from comorbid obesity. Aside from the known challenges of SMI and obesity separately, when an individual is diagnosed with both it may result in *additional health complications that may become exponentially harder to manage and lead to additional illnesses. This may result in a decrease in overall health over time.* These risks are a common concern for this population as those with diagnosed severe mental illness (SMI) are 3.04 times more likely to be diagnosed with obesity than those without a SMI (Afzal et al., 2021). Due to these concerns, the NEW-R program seeks to provide effective treatment for these conditions. NEW-R is a program centered around lifestyle redesign in which the client is taught the basics of healthy eating and movement and then is invited to trial these changes for themselves within the group and outside of group time (Center on Integrated Health Care & Self-Directed Recovery, n.d.). This program utilizes educational materials that encourages clients to adopt healthy habits and set individualized goals for themselves with support. In the pursuit of ensuring that the NEW-R program is a viable intervention option for clients, the PICO question for this study is *In clients with an SMI who have comorbid obesity, how effective is the NEW-R program in the pursuit of reaching a healthier BMI and reducing symptoms of SMI as evidenced by qualitative self-report and objective numerical reductions in BMI as compared to no intervention when it is implemented within an 8-week period?*

Given that NEW-R may be inaccessible for those with the most need it is the aim of this study to implement this programming through the offices of Southern Nevada Adult Mental Health Services, a nonprofit health care organization that caters to the needs of individuals with

SMI. By doing so, providing clients in need within this population with NEW-R programming will assist in procuring evidence of the effectiveness of the program and thus supporting an evidence base to justify implementing such programming. Today, very limited amounts of this research have been completed and it is for that reason that the investigative team associated with this study aim to produce results that may provide the necessary findings from this integral research that will support the usage of the NEW-R program for medical professionals.

To reduce the burden of obesity and improve overall health and wellbeing of those with diagnosed SMI, teaching these clients to manage a healthy weight through diet, lifestyle changes and exercise will help them to make lasting change and improve their health outcomes marked by reductions in BMI and experienced mental health symptoms. To achieve these prospects, this proposal will utilize the NEW-R program through the 6161 West Charleston Main Clinic of the Southern Nevada Adult Mental Health Services Office as a modality to educate, empower, and provide guidelines to enact a reduction in obesity and experienced SMI symptoms in participants adhering to the program. This proposal will address **obesity and psychiatric symptomology in clients with SMI** by focusing on two integral aspects of clients' condition; **1.) reduction in Body Mass Index (BMI)** which is used to measure client's condition of weight and **2.) Client-centered entrance and exit measures** which are used as an indicated measure of subjective participant improvements in SMI symptoms and overall satisfaction.

AIM 1: Evaluate NEW-R program's effect on reduction in Body Mass Index

1a. Compare the body mass index of clients prior to and after implementation of the NEW-R Program

1b. Identify factors that may result in increased BMI of clients and effectively manage these factors

AIM 2: Evaluate NEW-R program’s effect on reduction of SMI symptom severity

2a. Compare clients experienced mental health symptoms prior to and after the implementation of the NEW-R program

2b. Obtain information about participant understanding and implementation of NEW-R material

The data collected from the proposed study will stand to solidify the positive impact NEW-R has on client outcomes as related to the client’s ability to reach and maintain a healthier weight as evidenced by their BMI comparison prior to and after participation in the study as well as observed reduction in mental health symptoms as indicated by their pre- and post-test scores on the General Health Questionnaire-12 (GQH-12). By supporting the effectiveness of the NEW-R program the investigative team will better understand how to address the physical, cognitive, and learning needs of individuals within the target population while ensuring that the program is implemented in a way that motivates, engages, and ensures the participant’s long-term success after completion of the program.

SIGNIFICANCE

Risks for Severe Mental Illness Populations

A severe mental illness (SMI) is a generally non-physical illness that can affect an individual at any point in their lifetime, whether they are suffering from them on a short-term

or chronic basis (National Institute of Mental Health,2023). Psychiatric and medical services are often necessary for the management of SMI due to the severity of disability associated with the illness. Several disorders that are classified as SMIs include but are not limited to schizophrenia, bipolar disorder, schizoaffective disorder, and major depression. In addition to affecting cognition, thinking, and emotions, these illnesses can have internal and external triggers, according to the Substance Abuse and Mental Health Services Administration (2022). SMI patients often experience emotional dysregulation, distorted perceptions of reality, communication difficulties, loss, and an inability to maintain self-awareness, among other debilitating symptoms (Substance Abuse and Mental Health Services Administration, 2022). As a result of these symptoms, it may be difficult for a person to perform necessary self-care tasks and fulfill other adult responsibilities, often referred to as activities of daily living (ADLs) and instrumental activities of daily living (IADLs). ADLs and IADLs encompass tasks such as eating, toileting, sleeping, mobility, social interaction, home management, and more (Edemekong et al., 2022). An individual may require assistance in all aspects of their life if he or she is unable to complete such tasks. It is not uncommon for an individual struggling with SMI to routinely receive professional services and pharmaceutical assistance to achieve completion of their basic needs (National Alliance on Mental Health, 2022). Medications and health care services can become costly and difficult to obtain over time, but they remain a necessary part of the person's life. As a result, there is a risk of instability for these individuals. SMI clients who require assistance with ADLs and IADLs may also be unable to make independent decisions, thus requiring steady social support to assist them with everyday tasks (Chronister et al., 2015). Although these services may aim to support choice and decision-making, the dependence on professional assistance may hinder

the person regarding working towards goals and may result in a reduction in the person's sense of independence and autonomy; this may further exacerbate the symptoms and behaviors associated with their SMI (Treichler & Spaulding, 2017).

Considering the severity of deficits an SMI may create, it is imperative to note that this grouping of diagnoses is all too common today. There are 57.8 million American adults suffering from SMI as of 2021, more than one in five (National Institute of Mental Health, 2023). These disorders affect the individual in their entirety, decreasing a person's ability to be productive and affecting their overall function (U.S. Department of Health and Human Services, n.d.). As well, SMIs are associated with physical comorbidities and increased mortality in the population; those who develop one or more SMIs are likely to live 10-15 years shorter than those without (Fiorillo & Sartorius, 2021). In the American context, the prevalence of SMI not only imposes challenges on the individual but also on the population, including employment, poverty, and homelessness. As reported by the U.S. Department of Health and Human Services (n.d.), as of 2021 it is estimated that 14.1 million, or 5.5%, of all American adults suffer from SMI. Mental health disorders are highly prevalent among those who are homeless, with the mean prevalence calculated to be 76.2% (Gutwinski et al., 2021). Moreover, it is important to note that these disorders also affect those around the individual. As a result, the public is exposed to additional mental health disorders. According to Fekadu et al. (2019), SMI are usually chronic and relapsing in nature. A diagnosed SMI's impact is multidimensional and given how common and devastating it can be for an individual, solutions are necessary.

Prevalence of Obesity in Severe Mental Illness Population

Managing an SMI on its own can be a challenge for an individual and unfortunately, it is not uncommon for SMI to be accompanied by a myriad of serious associated health concerns including obesity (Zolezzi et al., 2017). Obesity can be defined as the condition in which an individual carries excess weight in the form of adipose tissue, leading to a body mass index (BMI) reading of >30 (Centers for Disease Control and Prevention, 2022). It is imperative to note that diabetes is one of the most prominent physical health concerns for individuals with SMI; this may occur alone or secondary to obesity (Bradshaw & Mairs, 2014). Type 2 Diabetes is a metabolic disorder most strongly associated with obesity; those with obesity account for 44% of diabetic cases and this incidence is expected to double to 300 million by 2025 (Leitner et al., 2017). Diabetes is detrimental in all cases, however, combined with the challenges that obesity and SMI contribute to a person's life, it may make intervening with each diagnosis that much more of a challenge. There are many factors that play a role in the development of obesity and diabetes in individuals with SMI. However, metabolic disorders play a significant role given the notion that they are a side effect of many psychiatric medications. Some of the other problematic consequences of these medications include avolition, sedation, and satiety reduction. This can lead to an increased risk of obesity and diabetes (Bradshaw & Mairs, 2014). As many SMIs are chronic concerns for individuals, these issues negatively impact the individual's overall well-being, which leads to obesity and diabetes. Recognizing these concerns means that the argument may be made that an individual's overall quality of life is likely to suffer due to SMI, obesity, and related consequences. It is imperative that obesity is addressed within this population for several reasons, but the most noteworthy may be the physical consequences that may occur when a person suffers from the disorder, such as limb loss that may be a result of diabetic complications (Walicka et al., 2021). Lower extremity

amputations (LEA) are common a common risk associated with diabetes; the disease accounts for 45%-70% of all cases according to Caruso et al. (2021). For people with SMI, this poses immense risk due to impeding already impaired mobility, increasing dysphoria and low mood, fatigue, and increased infection risks.

Due to the growing incidence of SMI and obesity in the population, these conditions pose a public health crisis. This warrants better management by healthcare systems due to their impact on the economy, workforce, and lifestyle culture. According to Fekadu et al. (2019), those with SMI may struggle with employment and family demands and require more involvement in the health care system. This may cause decreased productivity and increased medical expenses. According to Kjellberg et al. (2017), similar concerns are obesity-related risks of increased healthcare expenses increasing total average healthcare costs by 4. It's imperative to realize that while both disorders can occur independently, they are often co-morbid illnesses that can exacerbate one another if left untreated. Afzal et al. (2021) determined that individuals with a diagnosed SMI have a 3.04 times increased likelihood of being diagnosed with obesity than individuals without a diagnosed SMI. It is imperative to note that this risk is also accompanied by the risk of additional health complications over time.

Individuals with severe mental illness often require medical management of their conditions using pharmaceuticals that suppress physical and mental functions. This includes antidepressants, anti-anxiety medications, antipsychotics, among others. When body systems are suppressed to treat these disorders, individuals may become lethargic, have a lower metabolism, experience fatigue, or other impeding symptoms. People may gain additional weight because of these factors, as well as have more difficulty losing weight. According to Álvaro-Jiménez et al. (2008), "...Up to 80% of patients treated with antipsychotics experience

significant bodyweight gains. Weight gain adversely affects clinical outcomes and the well-being of patients with schizophrenia." Even though schizophrenia is just one type of SMI, these findings are related to antipsychotic medication side effects and these medications may be utilized to address a myriad of different diagnoses or symptoms. Furthermore, other psychotropic agents such as antidepressants that aim to manage psychological disorders have a similar effect on weight gain. This increases the likelihood that individuals being treated for SMI may have associated weight gain (Shrivastava & Johnson, 2010). Given that many individuals with SMI have symptoms that may be debilitating and must be managed, it is reasonable to assume that this risk of weight gain needs to be mitigated without stopping the associated medication. To address these concerns, lifestyle changes are the best way to ensure lasting improvement for the individual; these changes can be taught through interventions such as lifestyle redesign-type programming (Jessen-Winge et al., 2020).

Considering this grim cycle, it is of the utmost importance for individuals seek treatment for these conditions. Treatment plans should include lifestyle redesign interventions as part of the treatment process. According to Jessen-Winge et al. (2020) programs aimed at reducing body weight and making healthy lifestyle changes for those with SMI have proven successful with the right conditions including social support, creating self-belief, and maintaining habit changes. These successful programs lead to improvements in vital readings such as blood pressure, cholesterol, blood sugar, and other mental health improvements such as better overall mood, improvements in goal-setting abilities, and increased motivation (Dieterle, 2018). As a result, when there is a positive impact on the mental health status a person experiences, there is subsequent improvement in the overall perception of quality of life for the individual. To make these changes possible, the individual may encounter challenges, as it is often necessary

to upheave their everyday routines, roles, and rituals, which may pose challenges for them. Often, these routines are deeply ingrained in the individual's life, and they may seem insurmountable but with appropriate support and intervention optimization is possible (Pyatak et al., 2022).

Prognosis for Individuals with Severe Mental Illness and Obesity

There is no doubt that reducing body weight can drastically improve the overall health and wellbeing of those with SMI and co-occurring obesity. As a person lives with these conditions, it is imperative to note that along with increased body weight comes additional health disparities. This can lead to the overall breakdown of a person's ability to care for themselves and therefore their ability to thrive as an independent adult. This poses a global concern when considering the statistics associated that people with these disorders tend to continuously decline in health and are at increased risk of death without interventions (Afzal et al., 2021).

Fortunately, there are interventions that may help manage one or both conditions over time. In some cases, they may even result in resolving the diagnosis in its entirety, depending on the individual. Individuals who are obese and have SMI may be aware of their conditions and motivated to improve their health by changing their lifestyles (Young et al., 2017). By assisting individuals through proven therapeutic interventions for achieving lasting healthy and lifestyle changes, not only will they experience improved medical wellbeing, but also additional autonomy as well. Moreover, they will likely be able to reduce the overall symptom relief and increase their mental and physical health. With continued therapeutic interventions it is possible that even in chronic cases, SMI may be

effectively treated (Swarbrick & Noyes, 2018). The same course of treatment may prove helpful in managing weight to achieve a healthy BMI (Dieterle, 2018). Even though there are ways to manage both concerns separately, there are very few interventions that look at managing both as concurrent issues; this makes improving these concerns cumbersome for individuals who may already start with a decreased capacity to manage their health due to the nature of the diagnoses that are declared (Afzal et al., 2021).

To improve interventions available to individuals with a dual diagnosis of SMI and obesity who either have or are at risk of developing diabetes, it is proposed that treatment using programs that support improving everyday routines through lifestyle redesign may be a more effective solution. Lifestyle redesign is a form of occupational therapy intervention aimed at supporting health promotion and meaning through habit and routine creation (University of Southern California, 2023). Lifestyle redesign utilizes the approach of reviewing an individual's ADLs and IADLs, identifying behaviors or deficits that may decrease the person's wellbeing, and then working to enhance it through a series of healthy habits, changes, and choices through education and practice (Jessen-Winge et al., 2022). One such program that may be an appropriate fit for managing the unique needs of individuals with SMI and obesity is the NEW-R Program. The NEW-R program is an 8-week, group-based intervention that helps individuals to understand SMI and its impact, how healthy eating and exercise may affect physical and mental health, and how to improve diet and exercise by combining goal setting, group discussion, exercise, at-home and writing activities (Center on Integrated Health Care & Self-Directed Recovery, n.d.). The intervention aims to promote healthy habits related to diet and exercise. This will lead to lowering BMI and reducing SMI symptoms. This

intervention uses on-paper educational materials, social engagement, lectures, in-group engagement in the task, and the ability to form personal goals to provide a multi-modal, individualized approach for individuals enrolled. Lifestyle redesign interventions are effective for SMI patients, according to Fernández-San-Martín et al. (2013), with the most lasting results obtained from BMI interventions.

IMPACT

Very scarce research exists has been performed on effectiveness of lifestyle redesign-based programs for individuals with SMI and obesity. This project aims to contribute to the growing pool of evidence-based programs like NEW-R by evaluating if the intervention is effective and satisfies the needs of individuals who engage with it. By doing so, NEW-R and other similar programs will be more strongly endorsed and therefore more commonly utilized by medical professionals looking to help the target population of the program. Overall, this will provide an alternative to the current standard treatment options for these individuals. It will also provide a solution that addresses two diagnoses; both of which tend to have a drastic impact on an individual's overall mental and physical health.

INNOVATION

The NEW-R program is a program that can become the standard intervention for obesity in the SMI population. Furthermore, healthy habit changes have been known improve mental and physical health symptoms regardless of their impact to supporting a healthy weight. Both improvements are possible through the implementation of NEW-R; however, even if there may not be improvements in both target areas for participants, the NEW-R has

the potential to provide positive impact for participants of the intervention thus providing an overall positive impact on their prognosis regardless of the impact to both measures in tandem.

APPROACH

Investigative Team

The investigative team consists of the PI, Dr. Kaitlyn Hoffman, OTR/L. Dr. Hoffman is an occupational therapist working in the mental health field and has worked extensively with the target population. Much of the work she has been a part of includes working to address independence and support physical and mental health endeavors of individuals on an in-patient and out-patient basis. Dr. Hoffman has focused work on assisting individuals on weight management, mental health symptoms, and increasing independence in ADLs/IADLs. In addition to Dr. Hoffman, the team will consist of a nurse, biostatistician, registered dietician, and a certified occupational therapy assistant. These team members will help to provide individual supervision for individual health, diet, and exercise as well as assisting with the collection and analysis of data.

Research Strategy

To gain understanding about the benefits that the NEW-R program has as an intervention option for SMI individuals, the program must be run through its course, allowing for data to be taken and analyzed. This will allow the investigative team to provide best practices for utilizing this intervention with individuals pending IRB approval. The study will be utilized to highlight results that support the notion that utilizing healthy habit changes for

those with SMI and obesity, the impact will be more effective than other interventions currently recognized to be best practice for these conditions. **The overarching goal of this study is to determine if the NEW-R program is effective in reducing BMI and reducing reported symptoms of SMI for individuals with co-diagnosed obesity and SMI.**

Methodology

At the beginning of the study all necessary materials will be procured including data collection instruments such as a scale and tape measure, the Visual Analog Mood Scale, the General Health Questionnaire-12, Canadian Occupational Performance Measure, blood pressure cuff, pulse oximeter, and glucometer. Once these materials were obtained, a designated area of the facility would be reserved for the sessions to be run on a weekly basis for two-hours weekly. These two hours will allow time for reception, running the session, as well as data collection weekly. The investigative team will collect blood pressure, client weight and height, calculated BMI, voluntary food logs, hand-written goal sheets, blood sugars, blood pressure, heart rate before and after exercise, and results from assessments and surveys as given prior to session one and following session eight, and ongoing feedback from clients throughout the duration of NEW-R sessions. Following the NEW-R session completion, the investigative team would analyze collected data via paired t-tests to ensure that the NEW-R sessions experimental group obtained improvements compared to the results of the control. Following collection of the data, all information would be de-identified to maintain ethical responsibility to mental health clients. Following de-identification, the investigative team would make conclusions and recommendations based on the results and present the data.

The design of this study is a true experimental design to understand the long-term impact of learned material while involved in the program and the prospective future results of the clients. The design will also include pre-test/post-test design to understand baseline measures and change from baseline, hopefully supporting the hypothesis by indicating reduction in BMI as well as improvement in mental health symptoms. Selecting participants for a sample will include ensuring that those participating in the study have a BMI of 25 or high to indicate a level of obesity as well as having a professional diagnosis of an SMI. The participants of the study will come from referrals by the client's case manager, psychiatrist, or general physician to ensure they fit the requirements appropriate to test the hypothesis. To ensure validity of the study and associated analysis of data, triangulation will occur with client satisfaction measures such as surveys and interviews. Regarding quantitative data, all assessments will be from well-accepted and rigorously studied sources to ensure all measures are sound within the study. Following data collect, clients will debrief and be dismissed from the group sessions.

Population

The sample population for which the program will be run will be obtained through the clinicians within Southern Nevada Adult Mental Health Services from their current clientele. The obtained data from these participants will be a record of necessary quantitative data such as attendance, weight, BMI, diabetic status, and overall health status as well as qualitative data such as individual satisfaction, critiques, and comments on program implementation. To obtain a pool of participants, clients of Southern Nevada Adult Mental Health Services will be invited to take a survey to identify eligibility of participation. To ensure that the voluntary participant sample group suits the target population, eligible participants will be included on the basis that they have a diagnosed SMI and upon beginning the program have a BMI score of >25

indicating obesity, this will help to ensure validity of the information obtained. Once participants have been selected and consent to be part of the trial, a survey will be administered to gain an understanding of the person's current habits, everyday activities, goals, and current knowledge about health as it relates to nutrition and exercise. Following the trial, another survey will be completed to identify changes to the individual's habits and goals, identify achieved goals, and identify what new skills or information the participant was able take away from the provided programming.

Material and Supplies

To run the NEW-R program the necessary supplies and materials consist of the leader and participant manuals, composition journals, writing utensils, a scale, one computer per investigative team member, a television, and a printer/copier. Regarding facilities, to run this study, it is necessary to have access to a group room large enough to house the group, chairs and tables, and access to a second room or waiting room for participants to be held while private health information or discrete data may be taken.

Plan of Action

The NEW-R program utilizes an 8-week course with material that spans topics of both nutrition and exercise while challenging the participant to set and maintain goals related to the material on a weekly basis. The topics that NEW-R addresses are calories and nutrition, food groups, reading nutrition labels, how to select and shop for healthy food, how to budget for healthy eating at home, addressing healthy eating when at public establishments, exercise, and exercise options, and lastly, how to ensure lasting improvement and maintenance of healthy habits. Each session will also include a 20-minute exercise activity and data on participation and experience will be recorded to gain understanding about individual compliance with the

NEW-R program. The data collected will include pre-test/post-test information that will be statistically analyzed via paired t-tests against a control group that will later also be provided the same intervention. The data compared will include weight, BMI, blood sugar, blood pressure, and data obtained from the Visual Analog Mood Scale (VAMS). This method of analysis will provide insight about how well this intervention reaches the two defined aims as compared to no treatment to prove the intervention is an effective method of achieving weight loss and symptom improvement for individuals who are not otherwise able to achieve this goal.

By comparing the NEW-R program against no intervention it will highlight the fact that the influence of NEW-R on diet and exercise habits as well as cognitive reframing taught within the group lectures will result in a lasting improvement in these areas of wellbeing for the individual on a quantitative basis such that BMI will reduce, and number of days or severity of experienced SMI symptoms will decrease. The data obtained through qualitative means will occur at four points of the experiment; once prior to sessions, following session three, following session six, and finally after the conclusion of the group. Patients will be asked to share their thoughts about the intervention on the whole, their experience as it relates to experienced mental health symptoms, challenges they faced during the group related to session content, what they found to be successful changes that they made, their social engagement with members of the group, and their sense of motivation to pursue the maintenance of the health habit changes they have made as it relates to session information.

AIM 1: Evaluate if the NEW-R program results in reduction in Body Mass Index

BMI is a screening measurement that considers a person's weight divided by its square of height that helps to identify the mass of a person's body and is a generally accepted tool for identifying one's weight category from underweight to obese (Centers for Disease Control and

Prevention, 2022). BMI is a universally respected measurement for body weight that provides a means for medical practitioners to understand the results of the study that is respected within the medical community for reliability. Collecting the BMI of participants before and after the study will help to understand the success of the diet and exercise habit changes made by the individual relative to the reported goals and completed food diaries provided by the participants of the group. By comparing body mass changes to the initial value, it will be clear how effective the habit changes are regarding reducing BMI as well as indicate changes the individual makes following being provided with nutrition and exercise educational materials. It is expected that as the individual continues through the trial and thereafter, they will continue to increase healthy habits as it relates to diet and exercise and therefore the results of the study will show a decrease in BMI for participants that were compliant with and engaged in activities provided during the trial of the NEW-R program.

It is common that individuals with SMI and elevated BMI have a myriad of factors that may lead to the elevated values reported. These factors may include utilization of psychiatric medications that lead to metabolic disorders, medication noncompliance due to SMI symptoms such as avolition or forgetfulness, genetic pre-disposition, overeating due to symptoms or habit, chronic pain and inflammation, lack of mobility, physical disorders, and more (Bradshaw & Mairs, 2014). To ensure that participants are successful, these confounds will be addressed during pre-screening for participation and addressed during the first week of the program through means of providing medication compliance reminders, ensuring all diagnoses are under management and care by a primary care physician, and ensuring clients understand and abide by the demands of the study while completing the NEW-R program.

AIM 2: Evaluate if the NEW-R program results in reduction of SMI Symptoms

The NEW-R program encourages healthy diet and exercise habits to be adopted by individuals with SMI. Aside from the physical benefits that are achieved by adopting these habits, doing so will impact the person's severity and frequency of experienced SMI symptoms (Begdache et al., 2020). This trial's goal is to quantify decreases in these symptoms as affected by the inclusion of healthy habits as demonstrated within the program. The benefit of this for participants is that this will allow them to be able to reclaim autonomy and engage in more meaningful activities within their everyday life that changes the trajectory of their prognosis. It will also provide opportunities for the individual to practice independence through goal setting and making choices. If the NEW-R program can achieve a reduction in SMI symptoms for participants, this may mean that they may be able to complete more ADLs and IADLs independently and reduce their psychiatric barriers to doing so.

To understand whether improvements in this area occur for participants, data will be taken before and after they undergo the trial intervention. The means for assessing a participant's performance of everyday tasks they complete that will be utilized in this study is the Canadian Occupational Performance Measure (COPM). Additionally, the General Health Questionnaire (GHQ-12) will be utilized to assist in the assessment of symptom severity for the client. This metric is a reliable and valid measure for obtaining information about psychological distress (Hystad & Johnsen, 2020). It will be utilized to gain understanding about the severity of psychological symptoms program participants are experiencing at the time it is administered. It is expected that following the guidance of the NEW-R program and instilling healthy habits for diet and exercise will help to eliminate or reduce some of the experienced mental health symptoms that participants experience. By obtaining data from

individuals on their perceptions of the program and their personal opinions regarding NEW-R and their experience with the material, the investigative team will obtain information on what will strengthen the intervention for individuals overall; this will be managed through self-report via interview and survey methods.

The experimental design of this study will allow these data points to be taken from one group of clients completing the NEW-R intervention as compared to a control group. Given that the independent variables, BMI and mental health symptoms, are independently accounted for via pre- and post-test assessments, they do not necessitate a repetition of the trial with an additional set of participants. This may be beneficial to streamline data analysis and obtain both data points simultaneously and allows for the opportunity to analyze data to see if a correlation may exist between the two variables.

Potential Problems, Alternative Approaches, & Additional Considerations

Given that individuals within the target population generally live in residential care and group homes, it may be difficult for clients to access to additional resources and control of their schedules that may help them to achieve set goals. In addition to this, Southern Nevada Adult Mental Health Services does not mandate group engagement and attendance, ensuring group commitment and attendance may serve as a challenge. The investigative team will work to manage these risks through caregiver training and take-home materials reinforcing disseminated information. The investigative team will individually provide reminders and help to obtain reliable transportation for participants of the study. This study is aimed at the population within a specific institution; however, these results may be generalizable in other locations that fit the same criteria and goals; this provides assurance that this study may be run in a variety of mental health settings. One consideration for this study that is of note is

individuals with SMI are a protected class and therefore privacy, advocacy, and justice are of particular importance when addressing needs of those within the individual group. To uphold these ethical concerns in a dignifying manner for individuals, all information will be deidentified when published through the research as well as ensuring that all individuals are enthusiastic about participating and are providing consent following being informed of the goal of the programming.

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Curriculum Vitae

Kaitlyn A. Hoffman
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EDUCATION

University of Nevada Las Vegas, Las Vegas, NV

OTD Occupational Therapy Doctorate, 2020-2023

Capstone *NEW-R Intervention for Clients with Severe Mental Illness and Obesity: Grant Writing for Implementation Funds Support Occupational Therapy Interventions*

DePaul University, Chicago, IL

Bachelor of Science in Cognitive Neuropsychology

Bachelor of Art in French Language and Culture

Minoring in Islamic Word Studies, Studio Art, and Biology, December 2017

HONORS/AWARDS

- UNLV Occupational Therapy Department Scholarship 2021
- Saint Vincent DePaul Merit Scholarship
- DePaul Leadership Scholar
- O'Brien-VRBA scholar
- DePaul leadership and community service society member
- Inducted into National Society of Collegiate Scholars
- Earned Certificate of Leadership Development
- Honorable mention and multiple awards for art
- Dean's List

EXPERIENCE

UNLV Medicine Ackerman Center for Autism and Neurodevelopmental Solutions, Las Vegas, NV

September 2019-August 2021 *Registered Behavior Technician*

Provide therapeutic services for clients in clinic setting via ABA and EDSM.

Execute behavioral programs design by BCBA

Advise family on how to support clients and confer with BCBA's to ensure program success

Facilitate Group therapeutic sessions and outings

Record and maintain client data and program success

Spring Mountain Treatment Center, Las Vegas, NV

July 2019-July 2020, *Activity Therapy Assistant*

Lead therapeutic services for clients in an in-patient setting

Documented and filed activity, engagement, behaviors, and symptoms of patients through treatment notes

Advised family and individual on how to best provide support for patients

Record and maintain client data and program success

Cross-trained departmentally to provide services as Mental Health Tech (MHT) and support nursing team.

Autism Home Support Services, Northbrook, IL

February 2018-June 2019, *Care Team Member*

Provide therapeutic services for clients in home
Execute behavioral programs design by BCBA
Advise family on how to support clients and self-
Record and maintain client data and program success

Lutheran Social Services of Illinois (within Thorek Memorial Hospital and Methodist Hospital), Chicago, IL

July 2018-June 2019, *Crisis Counselor/Psychiatric Intake Specialist*

Assess Patients for in-patient psychiatric hospitalization and care needs
Counsel patients by providing resources, social support, and therapeutic engagement
Maintain and utilize functional knowledge of all company and hospital specific database per location
Coordinate clinical care for patients between hospitals, facilities, staff members and supervisors via paperwork and verbal coordination
Evaluate patient need for in-patient criteria based on assessment, providing pre-diagnosis and relevant data
Procure, create, and file all related medical and legal documents through multiple hospital and company databases

Family Guidance Center, Chicago, IL

June 2018-March 2019, *OMT Counselor*

Actively listen to the goals, needs and concerns of patients
Counsel patients by providing resources, social support, and substance education
Facilitate group counselling sessions
Assess patient for Methadone dose increases, appropriateness for outpatient program, and need for mental health or psychiatry needs
Evaluate Toxicology results and address results with patients
Establishes treatment plans, continued stay reviews and counselling notes

Athletico, Island Lake, IL

January 2018-June 2018, *Rehabilitation Assistant*

Advise patients on the usage of equipment, exercise form, sets and movements
Manage client forms, appointments, and charts
Teach new patients about the importance of their routines
Execute proper use of modalities such as fluidotherapy, ultrasound, cold laser, and traction

LEADERSHIP/COMMUNITY SERVICE/INTERNSHIPS/OBSERVATION/Fieldwork sites

- Southern Nevada Adult Mental Health Services OT Capstone student
- Boulder City Hospital OT intern

- ATI hand therapy OT student
- Hanger Orthotic and Prosthetic Clinic OT student
- Optimal Physical Therapy OT student
- Orthopedic Motion OT student
- Nevada Senior Services OT student
- UNLV OTD Mental Health fieldwork rotation OT student
- DePaul psychological research mentor
- Interfaith Leadership Scholar
- English Tutor/Teacher
- DePaul Leadership and Community Service Volunteer and Scholar
- French translation volunteer
- 1:1 Intern for The Arts of Life
- Member of Nevada Occupational Therapy Association
- NOTA Legislation, Advocacy, and leadership Intern
- SOTA Assembly of Student Delegates Representative
- SOTA fundraising Chair
- SOTA social Activities Chair
- 200+ Hours OT observation with Athletico, SNAMHS, and Thrive Therapies
- CSUN Mentor

SKILLS

Technical: Excel, Word, PowerPoint, Photoshop, Lightroom (basic), HTML (basic), PC/MAC operations, CareLogic, Insync, NextGen, Meditech, Interqual, Avatar, Central Reach, Epic, Theroffice, HIPPA compliance trained

Language: Intermediate French; Basic Arabic; Basic ASL-American Sign Language
Certifications: Grant Writing Basics (2023), Introduction to Certified Sexuality Occupational Therapy (2023), Herman and Wallace Pelvic Floor Therapy I (2022), MoCA, CarFIT, Mental Health First Aid, CPI, RBT (previous certification as of 10/2020), CPR/BLS (recertified as of 12/2021), ACLS/PALS (certified as of 12/2021), CITI training (Certified as of 01/2022), Basic First Aid (Certified as of 12/2021), IM CANS (02/2019), Handle with Care (as of 07/2020)