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Predicting Weight Management Advice Behavior Using Social Cognitive Theory Among Psychiatry Professionals

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Abstract

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MRCPsych, Royal College of Psychiatrists UK, 2010

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Obesity remains a public health concern among persons with mental illness resulting from the interaction of a combination of factors such as genetic, medication, effects of their symptoms, social, and environmental factors. Obesity complications account for increased mortality and morbidity, reduced life expectancy, and quality of life in persons with mental illness. The management of obesity is challenging and predicting the ability of mental health professionals to advise patients on weight management behavior is important to improve patients' overall well-being. The social cognitive theory constructs knowledge, expectations, situational perception, self-efficacy, and goal setting were utilized in predicting Weight Management Advice Behavior (WMAB) among psychiatry professionals. WMAB described the ability of professionals to effectively offer advice on managing weight. A cross-sectional study design was used, in which data were collected using a validated instrument. A sample size of 134 was used and the collected data were analyzed using simple and multiple linear regression, logistic regression and MANOVA. Self-efficacy, goal setting, knowledge, and situational perception were found to have a significant association with WMAB individually. Only self-efficacy ($p < .001$), goal setting ($p < .001$), knowledge ($p < .001$), and situational perception ($p < .05$) were independent predictors of WMAB among psychiatry healthcare professionals. There were significant differences among the professional groups with regards to knowledge, self-efficacy, goal setting, situational perception, and expectations. The study findings will bring about positive social change by informing the advice of professionals, reducing obesity and alleviating its burden among people with mental illness.

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Dedication

This study is dedicated to all persons suffering with mental illness. You are a special group of people and deserve the best in life just like everyone else. I hope the finding of this study will improve your overall well-being.

Acknowledgments

Special thanks to my research committee members Dr. Sharma, and Dr. Risica, for their outstanding encouragement, guidance and support all through the dissertation. I feel honored to be associated with you and to have tapped into your wealth of knowledge and wisdom. I am indebted to both of you and the URR – Dr. Gudeta Fufaa.

I am grateful to God Almighty for the strength and patience He gave me in the course of this study. I remain indebted to my wife Genevieve and my lovely children Jesse, Megan and Jason who have supported me all through this journey without complaining rather encouraging me to stay the course. I definitely owe you guys a lot in return.

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Chapter 1: Introduction to the Study

I investigated the Weight Management Advice behavior (WMAB) among mental health professional in Dudley and Walsall Partnership NHS Trust, United Kingdom. WMAB in this context refers to the ability to effectively offer advice on managing weight. This study is important because mental illness and obesity are both of public health importance. According to the World Health Organization (WHO, 2015a) estimates, 21 million, 350 million and 47.5 million of the global population suffer from schizophrenia, depression, and dementia respectively. The prevalence of obesity in persons with mental illness has been poorly studied; but, 20% to as high as 80% of patients with different psychiatric diagnoses have been classed as either overweight or obese (Correll et al., 2010; Maguen et al., 2013; McElroy et al., 2004; Pagoto et al., 2012). The prevalence of obesity also remains high with up to 1.9 billion of adults from 18 years of age and above, overweight and up to 600 million obese (WHO, 2015b). The world prevalence of obesity in those over 20 years of age described above represents about 26% of the world population (World Bank, 2015). Both mental illness and obesity have their associated problems and is argued to be the effect or cause of each other (Luppino et al., 2010; Wilkinson & Pickett, 2011).

Persons with mental illness have more propensities to gain weight and possibly become obese (Chwastiak, Rosenheck, & Kazis, 2011). The increase in weight among persons with mental illness could be attributed to their symptoms (Foussias & Remington, 2010), psychotropic medications (Cohn, Grant, & Faulkner, 2010; Dent et al., 2012; McCloughen & Foster, 2011; Nihalani, Schwartz, Siddiqui, & Megna, 2011;

Nihalani, Schwartz, Siddiqui, & Megna, 2012), as well as the effects of the interaction between their biological, environmental and social factors (Wilkinson & Pickett, 2011; Taylor, Stonehocker, Steele, & Sharma, 2012). Persons suffering from mental illness have increased mortality (Brown, Kim, Mitchell, & Inskip, 2010; Nordentoft, et al., 2013; Thornicroft, 2011) and morbidity rates (Henderson et al., 2014; Lindenmayer et al., 2014) in comparison to the wider population. Persons with mental illness experience reduced life expectancy (Chang et al., 2011; Laursen, 2011; Laursen, Munk-Olsen, & Vestergaard, 2012; Nordentoft et al., 2013; Wahlbeck, Westman, Nordentoft, Gissler & Laursen, 2011) and their state of health or quality of life is further reduced by obesity (Guo et al., 2013). Mental illness and obesity in combination has the potential to lead to an adverse outcome.

Persons with mental illness suffer from stigma in their communities because of their illness (Link, Struening, Neese-Todd, Asmussen, & Phelan, 2014), which is a similar experience with obese people (Puhl & Heuer, 2010). Stigmatization as a result of mental illness and obesity leaves persons with mental illness also suffering from obesity more vulnerable. One of the difficulties associated with weight gain in persons with mental illness is noncompliance with treatment (McCloughen & Foster, 2011), which then could cause deterioration of their mental health. The noncompliance associated with weight gain from treatment could be as a result of persons with mental illness viewing the risks associated with their treatments to outweigh its benefits. The latter highlights the importance of weight management among persons with mental illness. Managing weight

in persons with mental illness is challenging given the complexity of the co-morbidity of mental illness and obesity (Taylor et al., 2012).

The study is important to help understand why the challenges in managing weight gain in persons with mental illness exist. It is beneficial for understanding how well prepared mental health professionals are in preventing and controlling weight gain in their patient population. I explored their knowledge of obesity, the effect of their work environment, confidence, ability to set goals and expectations as it relates to WMAB. It is vital to understand how the above could affect weight management and subsequently address inadequacies that could see improvement in professionals' advice behavior.

The study is imperative because behavioral intervention in weight management has been found to be very useful to persons with mental illness (Daumit et al., 2013), pregnant women (Phelan et al., 2011), and obese people with cardiovascular risk factor (Appel, Clark, Yeh, Wang, & Coughlin, 2011). Advising persons with mental illness on behavioral interventions such as dietary modification and increasing physical activity is expected to reduce or control weight gain just like in the general population. The latter has the potential to bring about social change that will lead to the overall improvement of morbidity, mortality and life expectancy among persons with mental illness as well as reduce the cost of obesity.

This first chapter is an explanation of the study background, the problem statement, the study purpose as well as research questions ,and hypotheses. Also included are the measurement of variables, theoretical perspective for the study, the nature of the

study, operational definitions, suppositions, the scope and delimitations of the study, its limitations, and significance.

Background

Concern remains about obesity and its associated conditions in the wider society (Flegal, Carroll, Ogden, & Curtin, 2010; Ogden, Carroll, Kit, & Flegal, 2012; WHO, 2015b), which extends to the mentally ill population (Holt & Peveler, 2010). A reduction in life expectancy among persons with mental illness potentially is attributed to a broad range of factors including the problems associated with obesity (Hert et al., 2011; Tiihonen et al., 2009). Evidence-based strategies for the prevention and control of weight gain are being applied with varying success (Caemmerer, Correll, & Maayan, 2012; Daumit et al., 2013; Poston et al., 2015). The variation with regards to the outcome of evidence-based strategies, could pose an enormous challenge for weight management. The latter is more challenging because of the complexity of the causal pathway of obesity (Taylor et al., 2012).

Different strategies have been proposed and used such as dietary modifications, increasing activity level, to address weight gain problems among persons with mental illness (Daumit et al., 2013), psychological interventions (Hollon & Ponniah, 2010), and consideration of psychotropic medications prescribed (Hasnain & Vieweg, 2013). Reducing the prevalence of weight gain in the population of persons with mental illness is vital given it is high, and this calls for joint working between professionals and patients. McCloughen and Foster (2011) highlighted the lack of information on the prevention of weight gain given by mental health professionals to young people who are

prescribed psychotropic medications. In the general population, physicians' advice on weight management to obese and overweight patients has been found to be useful in weight management with patients making some behavioral changes with the view to lose weight (Rose, Poynter, Anderson, Noar, & Conigliaro, 2013).

No researcher has addressed WMAB of professionals working in psychiatry. As such, it is hard to tell if advising patients on weight management behavior is regularly done especially given that the patient population has more risk of obesity gain compared to the general population (Chwastiak et al., 2011). It is unclear as to how well it is done if it is being carried out at all. Studies in other populations using the SCT construct identified knowledge, self-control, self-efficacy, environment, and expectations to be useful predictors of carrying out behaviors aimed towards the management of weight (Anderson, Caswell, Wells, & Steele, 2013; Sharma, Wagner, & Wilkerson, 2006; Volkmann et al., 2014).

Given that Rose et al. (2013) identified that the lack of advice on how to manage weight among mental health professionals, it is only important that SCT constructs be used to understand if mental health professionals can offer advice to their patient population and possibly why. Understanding why the lack of information on weight management behavior to patients would be useful in predicting professionals' ability to offer weight management advice. There is also no study or literature on the identification of predictors of WMAB among mental health practitioners. These are gaps in the literature that need to be filled, and the study was aimed at answering questions that

would help fill these gaps. It is expected that the knowledge of the above would help in resources allocation, identifying training needs of professionals and policy development.

Problem Statement

The high prevalence of obesity is a concern given its public health implications, which is more problematic in persons with mental illness in comparison with the wider population (Holt & Peveler, 2009; Megna et al., 2011). The occurrence of complications of obesity in persons with mental illness is as a result of combined factors including psychotropic medications use for the treatment of their illness (Stanley, Laugharne, Addis, & Sherwood, 2013). The prevention and control of obesity are vital to the improvement of life expectancy in the mentally ill population; prevention and control will both reduce mortality and the morbidity rate caused by weight gain (Grover et al., 2015). An initial literature review showed three aspects of obesity: The relationship between obesity and overall state of health among persons with mental illness (Guo et al., 2013), challenges in the management of weight in persons with mental illness (Shrivastava & Johnston, 2010), and the need for competence in and use of evidence-based strategies among mental health professionals. Also evident was the need for professionals to actively get involved in the prevention, control and management of obesity in the mentally ill population (Taylor, Stonehocker et al., 2012).

While the above literature findings are all important, it was unclear from the literature as to why mental health professionals struggle with giving advice regarding weight management in their patient population. The latter could be responsible for the high obesity prevalence in their patient group (Lin et al. 2013; Pagoto et al. 2012). SCT

constructs such as self-efficacy, situational perception, self-efficacy, expectations, knowledge, and goal setting may be valuable in the determination of advising on obesity/weight management among mental health professionals. These SCT constructs could also be used to predict current abilities, strengths, and limitations of mental health professionals to offer evidence-based advice on weight management behavior and implement weight control and prevention strategies. Currently, theoretical models employed in predicting WMAB among mental health professionals are lacking in the literature.

Purpose of the Study

I examined the relationships between SCT constructs and advising on weight management behaviors, with the view to predicting mental health professionals' WMAB. This study was focused on health professionals' ability to offer weight management behavior advice to their patient group. To address the identified gap in the literature, a quantitative approach was employed in addressing the research questions and testing hypotheses. Information for the study was collected from healthcare professionals using questionnaires. Questions in the questionnaire were based on the following constructs of SCT: knowledge, self-efficacy, goal setting, situational perception, and expectations, which constituted the five subscales of the questionnaire.

Research Questions and Hypotheses

RQ1. To what extent does the knowledge of weight management behavior influence WMAB among mental health professionals?

H_0: knowledge has no statistically significant association with WMAB among mental health professionals.

$H_{1:}$ knowledge has a statistically significant association with WMAB among mental health professionals.

RQ2. To what extent does the work environment (situational perception) influence WMAB among mental health professionals?

H_0: Health professionals' work environment (situational perception) has no statistically significant association with WMAB among mental health professionals.

$H_{1:}$ Health professionals' work environment (situational perception) has a statistically significant association on WMAB among mental health professionals.

RQ3. To what extent does self-efficacy in offering advice on weight management behavior influence WMAB among mental health professionals?

H_0: Self-efficacy has no statistically significant association with WMAB among mental health professionals.

$H_{1:}$ Self-efficacy has a statistically significant association with WMAB among mental health professionals.

RQ4. To what extent do expectations (outcome expectancies and outcome expectations) influence WMAB among mental health professionals?

H_0: Healthcare professionals' expectations have no statistically significant association with WMAB among mental health professionals.

H_1: Healthcare professionals' expectations have a statistically significant association with WMAB among mental health professionals.

RQ5. To what extent does goal-setting abilities of mental health professionals influence their WMAB?

H_0: The ability of healthcare professionals to set goals has no statistically significant association with WMAB among mental health professionals.

H_1: The ability of healthcare professionals' to set goals has a statistically significant association with WMAB among mental health professionals.

RQ6: Is there any statistically significance difference among the professional groups with regards to Knowledge, Self-efficacy, Goal setting, Situational perception and Expectations scores?

H_0: There is no statistically significant difference in Knowledge, Self-efficacy, Goal setting, Situational perception and Expectations scores based on the professionals group.

H_1: There is a statistically significant difference in Knowledge, Self-efficacy, Goal setting, Situational perception and Expectations scores based on the professionals group.

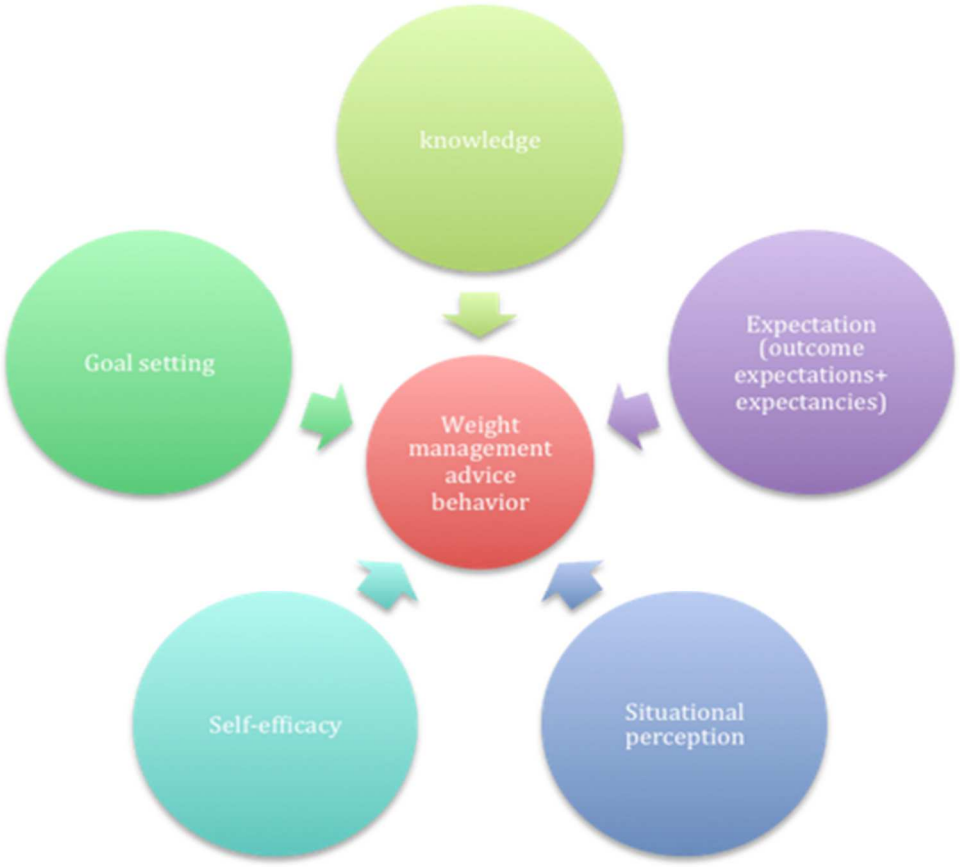

Figure 1. Social cognitive constructs hypothesized to be impacting on WMAB of mental health practitioners.

Measurement of Variables

The social cognitive theory (SCT) constructs of interest for the study were as follows: knowledge, expectations (outcome expectations and outcome expectancies), situational perception, self-efficacy, and goal setting. All the constructs were measured using the WMAB Scale (WMABS) developed for the study. General information including demographic details of respondents are also contained in the WMABS.

Theoretical Perspective

For the study, SCT was used and tested. Bandura suggested the SCT, which posits that behaviors exhibited by individuals are consequences of the reciprocal interaction between three factors: behavior, environmental factors, and personal factors (Bandura, 2011). The latter factor includes affect, cognition and biological elements (Bandura, 2011; Sharma & Romas, 2012). The SCT has been found useful in explaining, predicting, describing and controlling behaviors (Sharma & Romas, 2012). Its constructs and underpinnings, which emphasize the potential of human beings, have previously been used successfully in studies that predicted behaviors (Anderson-Bill, Winett, & Wojcik, 2011; Annesi & Whitaker, 2010; Branscum & Sharma, 2011; Brawley, Rejeski, Gaukstern, & Ambrosius, 2012; Sharma et al, 2006). The specific SCT constructs that were the focus of this study were knowledge, self-efficacy, goal setting, the environment, and expectations. These constructs were tested because knowledge is essential for any change in behavior or action, and it drives expectations (Bandura, 2011; Sharma & Romas, 2012). For behavior to occur, there is a degree of confidence that such action would be successfully carried out. Executing actions to an extent would depend on the

environment, social support, ability to set achievable goals, as well as knowledge of the proposed action (Bandura, 2011; Sharma & Romas, 2012). Other constructs of SCT such as self-efficacy in overcoming impediments, emotional coping, and environment were not included in the study because of the limited resources available for the study.

Nature of the Study

I used a quantitative, cross-sectional study design, given the relationship between and among variables would be investigated. The use of cross-sectional study design was also useful for the testing of the SCT, which is the theory forming the framework for the study. This design was used in testing potential hypotheses (Creswell, 2013; Kaplan, 2004). Some of the reasons for the choice of cross-sectional design are that it is easy and economical to carry out. It is suitable for assessing practices, attitudes, knowledge, and beliefs in a given population, with the view to establish the magnitude of the problem (Frankfort-Nachmias & Nachmias, 2008). Cross sectional study design does generate hypothesis for further and future studies; it only presents the prevalence of the outcome of interest and not the incidence (Creswell, 2013).

The independent variables were knowledge, expectations, self-efficacy, situational perception, and goal setting, which are all constructs of SCT. The dependent variable was WMAB and advising on weight management in the last 7 days, while the moderating variables were gender, age, previous training on weight management, professional group, the number of years of practice, directorate/area of practice, and ethnicity.

The target population for the study was mental health professionals employed by the Dudley and Walsall Mental Health Partnership Trust, United Kingdom. There was no sampling applied in the recruitment of participants rather it was expected that all the doctors, nurses, social workers, occupational therapist, and psychologists would participate. The WMABS, which includes questions on both the SCT, constructs of interest, and general information, was administered. The data obtained from the survey were input into SPSS 23, which is the software used for the analysis of the data. In data analysis, descriptive and inferential analyses were carried out. Preliminary analyses were carried out to identify potential confounding variable, which were included in the inferential analyses. For the inferential analysis, simple linear regression, multiple regression analysis stepwise method, logistic regression analyses, and multivariate analysis of variance (MANOVA) were employed in the testing of the hypotheses.

Operational Definitions

Knowledge: Refers to learning facts and improving insight (Bandura, 2004); in this case, related to obesity, its complications, and management strategies. Knowledge was defined as the summative score on a true or false scale of 10 items with a range of 0 to 10.

Expectations: Refers to both outcome expectation, which describes the probable outcome following carrying out a behavior or action and outcome expectancy which represents the value placed on the likely outcome (Bandura, 2004; Sharma & Romas, 2012). Expectations was defined as the sum of the multiplicative score between outcome

expectations and outcome expectancies on a 10-item Likert-type scale. The Expectations score ranged from 0 to 80.

Situational perception: Describes the perception and interpretation of one's environment (Sharma & Romas, 2012). For this study, the situational perception was related to the professionals' working environment. The situational perception was defined as the sum of the multiplicative score on a 4-item Likert-type scale. The score for situational perception ranged from 0 to 16.

Self-efficacy: The confidence to carry out behavior or action, which in this study is advising on weight management behaviors (Bandura, 2004; Sharma & Romas, 2012). Self-efficacy was defined as the sum of the multiplicative score on a 5-item Likert-type scale. The self-efficacy score ranged from 0 to 20.

Goal setting: To achieve change in behavior or action, steps are taken to set goals as well as developing plans on how to achieve such goals (Sharma & Romas, 2012). Bandura (2004) described goals as distal and proximal goals with the proximal goals essentially referring to intentions to carry out an action. It could be inferred that distal goals refer to aims. Goal setting was defined as the sum of the multiplicative scores on 8-1tem Likert-type scale. It ranged from 0 to 32.

Variables

All the independent variables were measured and scored using questions with responses in Likert-style scale. The dependents variable was WMAB and ‘advising on weight management in the last 7 days and these were measured using Likert scale and as a dichotomous variable respectively. The moderating variables of gender, age, previous

training on weight management, professional group, the number of years of practice, directorate/area of practice, and ethnicity, which are sociodemographic, and general information were collected using the WMABS.

Assumptions

It was assumed in this study that the range of participants included was representative of frontline staff in mental health facilities around the UK. Not including other hospital staff such as administration personnel, pharmacists, and cleaners, rather those in regular contact with patients did not affect the representativeness of the participants. It was assumed that the non-sampling of participants did not overtly affect the findings of the study as the professional groups were weighted to address nonresponse, under-representation or over-representation issues that could bias the study findings. Given the qualifications of the professionals involved in the study, it was assumed that they were able to read and understand information/questions contained in the questionnaire and respond accordingly. The use of the WMABS was considered to be adequate and appropriate for obtaining information on the variables of interest by the expert panel for the questionnaire development, with the view to find answers to the research questions and test the hypotheses.

Scope and Delimitations

I specifically examined possible predictors of WMAB among mental health professionals. The reason for focusing on the predictors of WMAB among mental health professionals was because of the increase in obesity in the mentally ill population. Obesity prevalence and its associated problems are worse among persons suffering with

mental illness in comparison with the wider population and lead to further disability in this patient group. Addressing obesity will improve the well-being of the mentally ill population as professionals will be able to see what they need to do to advise their patients effectively on how to manage excessive weight gain. I also looked at any differences in the ability of the SCT constructs of interest to predict WMAB in the different groups of mental health professionals. The reason for the latter was because there are variations in the level of contact with patients, variations in job descriptions and qualifications.

The participants included in the study were nurses, doctors, social workers, psychologists, and occupational therapists working in the Dudley and Walsall Mental Health Partnership Trust, UK. Community consent has been sought and given; but, the individual participants were also given consent forms with details of the study and had the right to decline participation if they so wished. Information about the study was communicated to all potential participants before the distribution of the questionnaires. Giving the participants information about the study was expected to help participants decide if they want to take part in the study or not. The professional groups were chosen because they have the capacity to comprehend the concepts linked with both obesity and mental illness and as such were able to complete the survey properly.

Limitations

The use of cross-sectional study design has limitations that could be problematic for the study. The inability to control for other factors that have the potential to explain the study findings and lack of considerations for the periods before and after the snapshot

is a possible limitation of the study (Creswell, 2013; Frankfort-Nachiams & Nachmias, 2008; Levin, 2006; Woodward, 2013). The study is not able to confer causality rather only associations and prevalence (Creswell, 2013). The lack of sampling or randomization of participants in the study of participants may impact on the external validity, as there is a likelihood of poor representativeness of the population of interest (Levin, 2006). Not using a prospective study design, which has the advantage of having both high degree of accuracy and efficiency (Frankfort-Nachmias & Nachmias, 2008), is a limitation. The latter is not necessary for this dissertation as it is more applicable to etiology of diseases.

The possibility of nonresponse bias was born in mind, as it could have influenced the representativeness of the population, which subsequently has the potential to affect the ability to generalize the study findings (Frankfort-Nachiams & Nachmias, 2008) especially in the case of this study that did not employ sampling or randomization. Recall bias is a likely limitation of the study as the questionnaires was also self-administered. The recall bias has the possibility of affecting the internal validity of the study (Frankfort-Nachiams & Nachmias, 2008; Woodward, 2013). Overall, possible inconsistencies in the way participants complete the questionnaire as well as uncompleted questionnaire will further negatively impact on the study's internal validity (Frankfort-Nachiams & Nachmias, 2008). Criterion-related validity was not done given the logistics and lack of resources, and as such could be viewed as a limitation of the study. The reason for the latter is because the validity of the study could be affected (Frankfort-Nachiams & Nachmias, 2008).

Significance of the Study

I explored an under-researched area of the management of persons with mental illness. Findings from the study have the capacity to increase understanding of weight control in the mentally ill population with particular emphasis on the predictors of WMAB among the healthcare professionals. The above is all the more important given the psychotropic medications employed in treating persons with mental illness could give rise to weight gain (Holt & Peveler, 2009; McCloughen & Foster, 2011). There is a need to advise persons with mental illness on weight management behaviors adequately to counter the potential weight gain from psychotropic medications. The study could further identify areas of training needs and support needed by the healthcare professionals in relation weight management.

The study was aimed at bringing about positive social change as it has the potential to have a meaningful impact on the ability as well as the confidence of mental health professionals to tackle obesity. Part of the positive social change will be creating the awareness of the need to address weight gain and subsequently improve practice among healthcare practitioners in this regards. In turn, patients could be able to acquire and maintain weight management behavior that would be useful in maintaining a healthy weight in the long-term. Findings from the study also could be helpful for policy makers in developing policies and procedures for weight gain management.

The results of the study form a basis for advocacy for weight management in persons with mental illness. As a result, the life expectancies of individuals suffering from mental illness could improve with a decline in the burden of illness associated with

weight gain. The improvement in weight in the patient population will not only reduce self-perceived stigma and experienced stigma as a result of obesity, but also give rise to high level of self-esteem and a better outlook on life, which potentially could lead to improved social inclusion/integration in their society. The integration into the wider society also could lead to persons suffering from mental illness who were obese being economically useful to their society as they could return to work.

There is the potential for reduction in the support and care burden regarding the direct and indirect cost to their individual families. With an improvement in WMAB by practitioners and subsequent reduction in the prevalence of obesity, there will be associated reduction in attendance to hospital appointments for obesity-related problems. The latter will subsequently decrease the cost of managing weight-related problems, hence saving resources and cost to the government, which could be diverted to other pressing needs.

Summary

This research study has been introduced in this chapter, highlighting the potential public health importance of controlling and preventing obesity in the mentally ill population through advising them on weight management behaviors. The questions answered and hypotheses tested were discussed as well as the use of SCT as my theoretical framework for the study. Also discussed in this chapter was the use of quantitative research methodology, cross-sectional study design for the study, the rationale for its use, advantages and disadvantages, data collection, analyses plans, delimitation and scope of the study, study significance as well as the limitations. It is

expected that the study will cause positive social change through informing evidence-based practice among the mental health professionals who will consequently lead to changes in lifestyle in their patient population with resultant improvement in their overall well-being.

Following this chapter is the literature review, which is focused on the identified gap in literature, WMAB among mental health professionals, which forms the basis of my study. The literature review helps demonstrate the public health importance of the identified gap in the literature.

Chapter 2: Literature Review

Introduction

In this literature review, I explored the prevalence of obesity in the world as well as in persons with mental illness. The possible causes of obesity in the mentally ill, the link between obesity and mental illness, strategies employed towards obesity management, mental health professionals' views on obesity as well as challenges in its management was sought. The role of theoretical models for the prevention and control of obesity was explored with specific emphasis on social cognitive theory, which forms the theoretical framework for the study. Gaps in the available literature were identified, and the potential impact of SCT constructs of interest, that is, knowledge, situational perception, expectations, self-efficacy and goal setting explored with the view for them to be used in addressing the gap in the literature.

Literature Search Strategy

The Walden University library was mainly used to find literature relevant for the study. The search utilized different databases such as MEDLINE, PsychInfo, Google Scholar, and Thoreau: Multiple database searches. Also used were CINAHL Plus, Cochrane Database of Systematic Reviews as well as Science Direct. The search was carried out using different combinations of the following search terms: *obesity, weight, weight gain, weight loss, overweight, obese, professional, practitioner, physician, nurses, occupational therapy, social worker, doctor, prevalence, incidence, epidemiology, cost, situational perception, environmental perception, environment, expectation, outcome expectation, outcome expectancy, knowledge, goal, goal setting, self-efficacy, efficacy,*

mental health, mental illness, psychosis, schizophrenia, depression, social cognitive, and *behavior change.*

Four hundred seventy-seven were generated in all and 132 abstracts read following a quick read of the generated articles' topics. The full text of 86 articles was read. A total of 33, of the articles, were from MEDLINE, 17 from PsychINFO, four from Cochrane Database of Systematic Reviews, 11 from Science Direct, five from CINAHL Plus and 16 from Thoreau. A further 16 articles were from Google scholar. The articles included were mostly peer-reviewed papers and published between 2010 and 2015. Other articles published earlier were included if thought to be essential, especially if there is no current article addressing similar issues. A further search was carried out manually, and this included looking at the references of obtained papers.

Theoretical Perspective

For this study, the SCT, which considers social origin of individuals' thoughts and actions as well as the influence of cognition on thought processes (Sharma & Romas, 2012), was used as a framework. The SCT, which evolved from social learning theory, was founded by Bandura and posits that personal factors that include cognition, emotion, biological activities; environmental factors and behavioral factors, reciprocally interact for an action or behavior to occur (Denler, Wolters, & Benzon, 2013; Sharma & Romas, 2012). Both internal and external factors influence behavior or an individual's action. SCT emphasizes the potentials of human beings and has the following underpinnings to support the claim according to Bandura (2011), Glanz et al. (2008), and Sharma and Romas (2012).

- It suggests that individuals have the ability to attribute symbols to their experiences (Symbolizing capacity).
- Individuals learn from others through observation of others behaviors and consequences of their behaviors or action (vicarious capacity).
- Individuals have the capability to regulate behavior through engaging in prior thought before behavior or action is executed or carried out (forethought capacity).
- Individuals have the ability to set internal standards for one's self and proffering self-evaluative reactions for behaviors or action (self-regulatory capacity).
- Individuals have the ability to both analyze one's experience and examine thought process (self-reflective capacity).

The SCT constructs include outcome expectations, situational perception, knowledge, self-efficacy outcome, goal setting/self-control and emotional coping. Others are environment, self-efficacy in overcoming impediments, and outcome expectancies. The SCT constructs demonstrate the processes for achieving and maintain behaviors (Bandura, 2011; Sharma & Ramos, 2012).

SCT has been employed in comparing and designing interventions for weight gain (Dennis, Potter, Estabrooks, & Davy, 2012) and obesity (Murnan, Sharma, & Li, 2006; Nyberg, Sundblom, Norman, & Elinder, 2011). SCT has also been found useful in predicting and explaining behaviors (Anderson-Bill et al., 2011; Annesi, 2011; Annesi & Gorjala, 2010; Annesi & Whitaker, 2010; Branscum & Sharma, 2011; Brawley et al.,

2012; Sharma et al., 2006). The knowledge of weight management behaviors is essential in the management of weigh-related problems. Knowledge forms the basis for the development of outcome expectations if actions are taken based on the knowledge available. The development of outcome expectationsin turn potentially would give rise to goal setting to ensure expectations are met (Sharma & Romas, 2012). In the case of mental health professionals, the perception and interpretation of their environment, which includes support for peers, availability of resources, policies, and procedures, would determine help to be offered to their clients who have weight problems. The confidence of mental health professionals in their ability to support their patient population adequately with regards to providing help on weight control could explain the difficulties identified in managing obesity in persons with mental illness.

I chose SCT over all other theoretical models, as it would be useful in predicting WMAB among mental health professionals. The choice of SCT is important in designing interventions that could help professionals engage actively in the advising of their patient population on weight management behaviors. The constructs of SCT, knowledge, expectations, situational perception, goal setting, and self-efficacy, formed the basis for the study. These constructs were chosen given the limited resources available for the study.

Obesity Prevalence

Obesity is simply described as body mass index (BMI) of over 30 (kg/m^2). It is characterized by the harmful build-up of fat tissues (Flegal, Carroll, Kit, & Ogden, 2012; WHO, 2015b). Calculating the BMI requires height to be measured in $meter^2$ and weight

in kilograms. Obesity is a public health concern given the numerous complications associated with it. Examples of obesity complications are heart diseases, hypercholesterolemia, metabolic syndrome, cancers, osteoarthritis (WHO, 2015b) Type 2 Diabetes Mellitus (Ashen & Blumenthal, 2014; WHO, 2015b), gastro-esophageal reflux disease (Wu et al., 2014) and gallstones (Bonfrate, Wang, Garruti, & Portincasa, 2014). Further complications of obesity are liver and kidney diseases, reduced fertility, sleep apnea, complications in pregnancy, psychological problems including depression, and eating disorders (WHO, 2015b). The occurrence of these complications of obesity increases as BMI increase (WHO, 2015b). The latter demonstrates the burden of the condition and could also give an insight into its cost to the society.

The cause of obesity is multifaceted and has been popularly described using the ecological model. The ecological model considers the influence of personal factors, interpersonal factors, institutions, community, policies and systems on the health and wellness of an individual (CDC, 2013). Being in an obesogenic environment, which describes conditions that encourage weight gain, while at the same time discourages weight loss, increases the risk for obesity (Swinburn, Egger, & Raza, 1999). The obesogenic environment is categorized into two levels, microenvironmental level that comprises of families, neighborhoods, places of work, schools and health organizations. The macroenvironmental level includes the media, food manufacturing and production, health systems, professional organizations, and marketing (Swinburn et al., 1999). These concepts of the obesogenic environment have proved useful in obesity interventions

(Looijmans, et al., 2014) and food availability in households (Soares, França, & Gonçalves, 2014).

According to WHO (2014), world obesity prevalence has been increasing and doubled over the last 30 year with over 1.4 billion individuals over 20 years are obese. The above claim affirmsed Flegal et al. (2012) who suggested that obesity prevalence had doubled between 1980 and 2014 and it accounts for more disease state and mortality when compared with the overweight group. According to Flegal et al., no notable changes occurred in the prevalence of obesity in the US population from the year 2003 to 2008 when compared to the prevalence between the years 2009 and 2010, though its occurrence remains high. Among children, adolescents, and the male population, obesity prevalence increased while the female population had no overall changes suggesting likely leveling off of obesity prevalence in the female population between 1999 and 2004 (Ogden et al., 2006).

Steady rise in obesity prevalence occurred between 1976 and 1980 and between 1988 and 1994. The increase reflected the global trend of obesity prevalence when definitions, which are standardized, are applied in comparing international trends (Flegal, Carroll, Kuczmarski, & Johnson, 1998). Flegal et al. (1998) suggested a slowdown in the obesity prevalence in some sections of the world, but its high prevalence remains a concern. Attributing the cause of obesity to a single cause is difficult rather the interaction of multiple factors namely, genetic makeup, social, and environmental determinants of health are involved in its causation (Jebb, 2014; Wilkinson & Pickett, 2011; Wright & Aronne, 2012). The claim above is supported by Wright and Aronne

(2012). Wright and Aronne showed possible causes such as diet, decreased activity level, reduction of cigarette smoked, decreased variation of ambient temperature, endocrinology disturbances, and medications were highlighted. WHO (2015b) further emphasized the impact of societal changes and the associated non-supportive government policies particularly in areas such as the health sector, urban planning, agricultural sector and transportation to be potential causes of obesity. WHO also identified as potential obesity causes by the latter are policies on the environment, education, food processing, and how it is distributed and marketed.

Mental Illness

Mental illness describes a group of diagnosable conditions characterized by the mood dysregulation, affectation of thought process and behavior of an individual (Gelder, Juan, & Nancy, 2004; WHO, 2015b). Such dysregulation could lead to the lack of reality and potentially could be distressing to the sufferer as well as impairing their overall functioning (Gelder et al., 2004; Zatzick et al., 1997). Functional impairment has been identified even before the overt manifestation of features of mental illness (Cannon et al., 2015; Tiihonen et al. 2014). Some examples of mental illness are depression, bipolar affective disorder, psychotic disorders, and dementia.

A proportion of the world population is deemed to have a form of mental illness with depression estimated to have a prevalence of up to 350 million. The prevalence of dementia is up to 47.5 million with a yearly incidence of 7.7 million and schizophrenia prevalence up to 21 million, 12 million of which is men (WHO, 2015b). In the United Kingdom, one in four persons in the population suffers from a mental illness according to

HSCIC (2009). The prevalence of depression, anxiety, mixed anxiety and depression, eating disorders, and personality disorders are 2.6%, 4.7%, 9.7%, 1.6%, and 3-5% respectively. Obsessive compulsive disorder (OCD), phobia disorders, post traumatic stress disorder (PTSD), panic attack, schizophrenia, and bipolar affective disorder have a prevalence of 1.3%, 2.6%, 3%, 3-5%, and 3-5% respectively (HSCIC, 2009). The cause of mental illness is not attributable to a single factor, rather a combination of interacting factors. Some of the involved factors in mental illness causation are genetics (Sullivan, Daly, & O'Donovan, 2012; Sullivan, Neale, & Kendler, 2000), perinatal infections (Meyer, Feldon, & Dammann, 2011), environmental factors (Lorenc et al., 2012; Stein, Jang, Taylor, Vernon, & Livesley, 2002) and social factors/social support (Wilkinson & Pickett, 2011). Also implicated are stressful/traumatic life events (Bryant et al., 2010; Shrira, Shmotkin, & Litwin, 2012), biochemical imbalance (Gelder et al., 2004; Howes, McCutcheon, & Stone, 2015) and economic-related issues (Gili, Roca, Basu, McKee, & Stuckler, 2013; Patel, Rodrigues & DeSouza, 2002).

According to WHO (2015b), up to half of mental health sufferers do not have access to adequate treatment. The lack of access to mental health treatment as suggested by WHO could account for the established concern that the duration of untreated mental illness, especially for psychotic disorders, makes for poor prognosis (Abdel-Fadeel et al., 2013; Valmaggia et al., 2015). The dearth of access to adequate treatment is arguably as a result of stigma associated with mental illness (Eisenberg, Hunt, & Speer, 2012; Henderson, Evans-Lacko, & Thornicroft, 2013), inadequate education on mental health as well as how help could be accessed (Henderson et al., 2013), cultural issues affecting

help-seeking behaviors (Garland et al., 2005; Yang et al., 2013), inadequate funding of mental health facilities by governments (Christensen et al., 2011), the paucity of trained mental health professionals (Kakuma et al, 2011), health care system design (McGorry, Bates, & Birchwood, 2013), and poverty (Alegria et al., 2002).

The treatment offered to mental health sufferers depends on their presentation and needs. A combination of treatment with psychotropic medications, psychological intervention and social support form the basis of treatment of mental illnesses (Buckner, Heimberg, Ecker, & Vinci, 2013; Gelder et al., 2004). The treatments are offered in different settings i.e. community, inpatient and prisons. Primarily, nurses, doctors, and psychologists administer the treatments with social support managed by social workers. Occupational therapists are involved in rehabilitation works with patients as well as assessments for living skills.

Descriptive Epidemiology of Obesity in the Mentally Ill Population

There is no published literature highlighting the global prevalence of obesity or increase in weight among persons with mental illness. The lack of published literature on the prevalence of obesity in the mentally ill is also the case with the United Kingdom population where this study was carried out. Estimates of prevalence from studies suggested about 40-60% of patients with a diagnosis of schizophrenia are overweight or classed as obese (Mitchell et al., 2013). Obesity prevalence among depressed patients is put at about 20%-50% and between 25% and 60%, among bipolar affective disorder patients (McElroy et al., 2004). Similarly, Correll et al. (2010) found almost 80% of patients with suffering from schizophrenia, bipolar affective disorder, or depressive

illness are overweight or classed as obese. About 32.6% of patients with a diagnosis of PTSD, in the US are obese (Pagoto et al., 2012). Among US Iraq and Afghanistan veterans, those suffering from PTSD and depression had the highest risk of weight gain (Maguen, et al., 2013). The prevalence of obesity in the different mental health diagnoses groups mentioned above are higher compared to the general population, which is put at about 26%. The latter claim is extrapolated from the WHO figure of 1.9 billion of over 20 years old in the world overweight/obese (WHO, 2015), and world population of 7.3 billion, reported by World Bank (2015).

The exact obesity prevalence in the other mental health disorders seem to be poorly studied; but, it is thought the prevalence of obesity among individuals with personality disorders in Western Australia is about 30% (Stanley et al., 2013). Stanley et al. (2013) found the obesity prevalence in psychiatric inpatients to be 30.3% as opposed to of 21.4% among the general population. There is a consensus that overall, mentally ill people have higher obesity prevalence in comparison to the wider population (Holt & Peveler, 2009; Megna et al., 2011; Mitchell et al., 2013). The latter claim was also reflected in the mental illness prevalence among patients seeking treatment for obesity in Taiwan with 42% having, at least, a diagnosable mental illness (Lin et al., 2013).

Obesity and Mental Illness

Persons suffering from with mental illnesses are not immune to factors that could predispose to obesity, that is, environmental, social and genetic factors; rather, they have a higher risk (Bradshaw & Mairs, 2014). Psychotropic medication use is estimated to be responsible for metabolic syndrome or weight gain in 70% of the mentally ill population

(Newcomer, 2006). One of the constituents that characterizes metabolic syndrome is obesity, alongside raised blood pressure, blood glucose, triglycerides, and low level of high-density lipoprotein (Fagiolini, Frank, Scott, Turkin, & Kupfer, 2005). Obesity arises as a consequence of the reciprocal actions between genetic factors, unfavorable environmental influences and drug treatment (O'Rahilly, 2009). Metabolic syndrome also increases heart-related disease and Type 2 diabetes mellitus risks (Leonard, Schwarz, & Myint, 2012). Metabolic syndrome shares similar features with obesity; as such they could be confused with each other. The impact of metabolic syndrome and obesity on physical health has led to calls for regular monitoring of persons with mental illness on psychotropic medications (Stanley & Laugharne, 2012).

Obesity is associated with mental illness and it is continually debated if one is the cause or effect of the other (Chwastiak, Rosenheck, & Kazis, 2011). Psychotropic medications use among persons with mental illness is linked to increase in weight (McCloughen & Foster, 2011; Nihalani et al., 2012; Taylor et al., 2012). The above-mentioned link between psychotropic medications and increase in weight is mediated through different pathways such as antipsychotic-genetic interactions (Chowdhury et al., 2013) though this was not the case in Brandl et al. (2013). The latter study's sample size was not adequate, and the BMI information for the participants was lacking as well as the lack of representativeness regarding clinical characteristics and participants prescribed medication. Psychotropic drugs potentially increase appetite if the neuronal circuit, which regulates appetite, is affected (Wysokinski & Kloszewska, 2014). The latter also

could be the case if any of the other systems involved in the regulating of energy homeostasis is affected (Wysokinski & Kloszewska, 2014).

As a result of psychiatric symptoms, mentally ill people could become withdrawn from the society and have been found to become inactive physically (Nyboe & Lund, 2013). On the other hand, the side effects of their medication could potentially predispose to inactivity, for example, drowsiness or extrapyramidal side effects could limit mobility given the associated falls (de Groot et al., 2013). The lack of insight into their mental health as well has the potential to impact on their capacity to make some life changing but healthy decisions, that is, compliance with weight gain management behaviors (Hert, et al., 2011). Chronic stress associated with their illness could predispose to hormonal deregulation with subsequently increased appetite or comfort eating (Pagoto et al., 2012). The subsequent comfort eating could be viewed as coping strategy for the stress they undergo. These consequences of hormonal dysregulation mentioned above could explain the reduced perception of psychological stress among depressed patients, who comfort-eat (Finch & Tomiyama, 2015).

On the other hand, obesity has the potential to predispose to mental illness among it's suffers. The resultant mental illness comes in the form of problems with body image and reduced self-esteem, both of which have the potential to cause depression (Harriger & Thompson, 2012; Jackson et al., 2012). In severe cases, suicidal behavior has been identified as having a positive association with obesity among bariatric surgery patients (Heneghan et al., 2012). The positive link between obesity and suicide is not lent credence by Abdiasis, Ahmad, Benson, and Muhim, (2015) whose findings were

inconclusive as there were four articles included in the study, which showed no association between obesity and suicide. Two other researchers listed in the latter study suggested a positive relationship between obesity and diagnosable mental illnesses which has the potentially to lead to suicide, and finally, the last two researchers suggested an inverse relationship between suicide and BMI. The claim of a link between obesity and suicide has been rebutted by Klinitzke, Steinig, and Blüher (2013), who found that obese people are at less risk of suicide in eight of the 15 articles included in the study. The latter study needs cautious interpretation as it included only 15 studies, mostly cross-sectional studies and there was no consideration made regarding the severity/classes of obesity. These psychological impacts of obesity arguably partly influenced by the stigma associated with the condition among the public (Ambwani, et al., 2014; Sikorski et al., 2011).

The cost of obesity and metabolic syndrome among persons with mental illness is enormous (Megna et al., 2011). There is no known global or UK estimate of the cost of obesity in the mentally ill population. Globally, it is estimated that obesity costs up to 0.7 – 2.8% of healthcare budget of a country in terms of direct cost in general population (Withrow & Alter, 2011). In monetary terms in the UK, the direct cost of obesity as at 2007 was £4.2 billion as against £479.3 million in 1998, while the indirect cost ranged from £2.6 billion to £15.8 billion over the same period. The indirect cost is projected to increase to £27 billion by 2015 (National Obesity Observatory, 2010). According to the UK Department of Health (2013), treating obesity-related problems is costing the UK

government approximately £5 billion annually, and there is an expectation the annual cost will double by 2050.

Apart from causing severe health conditions such as Type 2 diabetes mellitus, heart-related problem as well as different variety of cancer (Leonard, Schwarz & Myint, 2012), reduced life expectancy in the mentally ill population is attributed to obesity. Mortality rate in this group continues to grow wide in comparison with the broader population. A death rate three times higher is estimated for the mentally ill population in comparison with the wider population. (Nielsen, Uggerby, Jensen, & McGrath, 2013; Megna,et al., 2011). Megna et al. (2011) posited that the reported high prevalence of disease state among persons with mental illness has a link with healthcare accessibility disparity, health facilities utilization, and care provision. Aanother significant impact of obesity among persons with mental illness is its association with non-concordance to treatment for their psychiatric conditions (Holt & Peveler, 2009; Weiden, Mackell, & McDonnell, 2004) and the nonconcordance to psychotropic treatment potentially further reduces their overall quality of life (Guo et al., 2013).

Appreciating the burden of obesity and knowing it is preventable (WHO, 2015b; Wilkinson & Pickett, 2011), strategies and recommendations geared towards tackling obesity and the subsequent reduction of its associated burden of illness have been made. The WHO recommended strategies to both prevent and alleviate obesity and it covers different i.e. individual level, societal level and manufacturers levels (WHO, 2014). The strategies encourage the provision of a supportive environment, which is vital as it influences individual choices. Individuals are expected and encouraged to take some

responsibilities by limiting their energy intake, eating more fruits and vegetables, food containing whole grain, legumes, nuts, and also to engage in physical activities. The above mentioned environmental and individual-level recommendations should be made available to the wider society. The government is expected to demonstrate political commitment as well as cooperating with agencies and stakeholders. They also have the responsibility to make available opportunities or built environments that would promote physical health activities as well as making available healthier food choices, which should be both affordable and accessible regardless of socioeconomic status. Finally, it is expected that the food industry take responsibility in ensuring that fat, sugar, and salt in food are reduced. The food industry is also expected to make available to the public a broad range of nutritional choices as well as ensuring that their marketing of food is responsible (WHO, 2015b).

The strategies mentioned above could be applied in different combinations to different populations. Some individuals may be in need of more than the strategies highlighted above by the WHO and Nguyen et al. (2012) who recognized this as unmet needs. Such individuals may require interventions such as surgery and pharmacological interventions. Health education is identified to be a good strategy for tackling behavioral changes (Glanz et al., 2008), which is important in prevention and control of obesity. Health education should be prioritized in the intervention strategies regardless of the community in the society being targeted. The health education must be adjusted to meet the needs of the particular community to ensure effectiveness (Liu et al., 2015).

In the mentally ill population, interventions aimed at lifestyle modifications are effective in obesity treatment and prevention, and reduce cardio-metabolic risk factors (Bruins et al., 2014). Bruins et al. (2014) contains only four high quality studies out of 25 randomized control studies selected; its findings lent credence to the multicenter interventional study by Attux et al. (2011). Attux et al. suggested improvement in the anthropometric profile of the participants with non-pharmacological intervention (counseling on nutrition, life style changes, physical activity) for weight gain management. Similar findings were made by Attux et al. in patients with diagnosis of schizophrenia following a six months RCT investigating the efficacy of lifestyle intervention in weight management. A behavioral intervention which comprising of group and individual weight-management sessions, and group exercise sessions, resulted in progressive weight loss over a period of 18 months in the intervention group in comparison with the control group (Daumit et al., 2013). Bonfioli et al. (2012) found psycho-education with or without cognitive behavioral intervention targeting weight reduction or weight gain prevention to be effective in weight management among mentally ill people. The highest impact was through psycho-educational programs, which included dietary and physical activity.

A nurse-led weight management study focused on mentally ill people receiving antipsychotic medication showed an improvement in the mean weight changes of the intervention group after 3 months; but, the findings were insignificant statistically (Usher, Park, & Foster, 2013). The above result could be attributed to the nonbinding nature of the study, the location of the intervention groups (recreation parks/gym near some

intervention group sites), the ability of participants to understand the information being passed (health education) and the participants' recruitment method. Another nurse-lead strategy for weight gain management in persons with mental illness who are receiving treatment in the form of second-generation antipsychotics is Passport4life. Its concepts include motivational interview, nutrition and exercise education in combination with weekly exercise (Parker, Usher, & Foster, 2011).

Challenges of Obesity Management in the Mentally Ill Population

Given the complexity of obesity and more so in the mentally ill population (Sharma, 2012), it is understandable why its management could be problematic. Striking the balance between improving mental state and maintaining adequate weight could be challenging in the mentally ill. The challenge in achieving the balance in their treatment is because of the combination of factors mentioned above, that is, psychotropic medication, stigma, psychological issues, low self-esteem, social exclusion, and isolation, all of which contribute to excessive weight gain and subsequently obesity (Cook & Mueser, 2013). This means that mentally ill people live in the obesogenic environment. Mental health practitioners could maintain this obesogenic environment by prescribing psychotropic without educating their patient group about the associated risks or side effects. Educating patients and carers about the risks linked to psychotropic medications are expected to help mentally ill people and their families make informed decisions regarding their treatments. The health education on medication should be complimented with weight management support using evidence-based models.

The need for practitioners working in the mental health setting to acquaint themselves with the complexity and obesity management has been suggested (Sharma, 2012). This raises questions about the competencies of mental health professionals in weight gain management. There are concerns about how seriously obesity is viewed a problem in psychiatry and its response to putting in place policies to prevent or control obesity (Cook & Mueser, 2013). Just like in other communities, cultural sensitivities as it relates to translational approaches, for example, use of languages inappropriate for a population could pose a challenge in obesity management (Shaibi et al., 2012). Mental illness could impact on their capacity to make decisions on healthy life choices, such as diet or exercise.

Mental Health Professionals' Views of Obesity

The need to manage obesity has received huge of attention in certain fields of medicine (Batch & Baur, 2005; Jensen et al., 2014; Yumuk, Frühbeck, Oppert, Woodward, & Toplak, 2014). Little is known about the attitudes of psychiatry professionals towards obesity. A survey of psychiatrists aimed at understanding their practice pattern and attitudes towards metabolic syndrome, which has obesity as a component, suggested a good level of awareness of the problem. A majority of the participants said they considered the impacts of antipsychotics with regards to metabolic syndrome and were willing to change patients' medication as a result. More than 40% of the participants were of the opinion they would choose the benefits from antipsychotics over the risk of weight gain and diabetes mellitus in their patients (Newcomer, Nasrallah, & Loebel, 2004).

In comparison to other specialties of medicine such as pediatrics, professionals prioritize managing obesity and have had favorable results following the offering of intensive interventions to their patient population (Barlow & Dietz, 2002). The pediatric professionals identified the need to intervene with the view to address obesity problem and also showed interest in taking part in training on behavioral management of obesity and the required parenting techniques, which demonstrates proper attitude towards obesity (Story et. al., 2002). A cross-sectional study carried out with European pediatric care providers; implementation of guidelines for obesity management was a problem across the countries surveyed (Mazur et al., 2013). Cardiac rehabilitation professionals in another study demonstrated negative attitude towards obesity in the form of high fat phobia levels and anti-fat attitude (Wise, Harris, & Oliver, 2014). The latter study's finding was useful in guiding the education of cardiac rehabilitation professional on both nature and possible causes of obesity. All these were geared towards ensuring that their patients 'outcomes are improved (Wise, Harris, & Oliver, 2014).

The termination of attempts to lose weight by patients is associated with professionals' attitude towards obesity (Maiman, Wang, Becker, Finlay, & Simonson, 1979). Professionals' knowledge of the causes of obesity and treatment are reflected in their attitude towards the condition, which is perceived by their patients. The attitudes of professionals toward obesity have no relationship with the professionals' background, qualification gained or the condition of practice (Maiman et al., 1979). Weight bias among eating disorder professionals has been identified as a challenge in the management of obesity as professionals attribute obesity to behavioral cause (Puhl, Latner, King, &

Luedicke, 2014). Similar findings are also reported in trainee healthcare professionals who have weight bias (Swift et al., 2013) and obesity management (Puhl, Luedicke, & Grilo, 2014). Trainees with such bias towards obesity possibly could progress in their careers maintaining such ideas/bias to the detriment of the patients. Galuska, Will, Serdula, and Ford (1999) identified in their study that patients classed as obese reported they got no health education or advice regarding obesity or losing weight from the healthcare practitioners they encountered, and this leaves one wondering what is responsible for the inability of professional to advise on obesity management.

There is a tendency for healthcare professionals working in mental health settings to use biological model only in explaining obesity. Potential impact of the triad of environmental social and health determinants with regards to obesity cause as identified by Cook, (2013) and Ohri-Vachaspati, DeWeese, Crespo, Todd, and Yedidia, (2013) is being ignored. If so, this will mean that the level of knowledge of obesity among mental health professionals is not adequate. The above could be useful in explaining the emphasis on the need to stabilize mental state while at the same time not taking into consideration their physical health as was found by Newcomer et al. (2004). All clinics regardless of specialty ideally should be making information on obesity available and accessible to patients, educating them on the magnitude of the problems associated with obesity as well as campaigns/evidence-based strategies for its control (WHO, 2015b).

Some of the barriers to advising on weight management among physicians in primary care setting include constraints with regards to time, ambivalence about the effectiveness of counseling about weight control, inadequate counseling skills, none

availability of financial incentives and organized approach (Douglas, Torrance, van Teijlingen, Meloni, & Kerr, 2006; Tsai, Abbo, & Ogden, 2011). It is unclear if these factors are attributable to mental health professionals as no known literature are addressing those in this group and as such would be important to investigate. The perceived role of psychiatry professionals in managing obesity and or overweight in their patient population is unknown. Traditionally in the UK, every patient is registered with a general practitioner (GP), who oversees the care of patients in the primary care setting. Persons suffering from mental illness consult their GPs for monitoring of their physical health while the mental health professionals regularly review/monitor their mental state and effects of prescribed psychotropic medications (RCPsych, 2016).

Use of SCT Constructs in Obesity Management

Given the under-researched nature of WMAB among psychiatry professionals and the inability to determine why management of obesity in the mentally ill is challenging, it was appropriate to understand previous studies related to weight management. These studies were useful in identifying constructs that could be beneficial in the study. I focused the literature review at studies based on the five identified constructs of SCT, knowledge, expectations, goal setting, self-efficacy, and situational perception.

Potential Impact of Knowledge on Weight Management Behavior

Knowledge is essential for change in behavior, and this is gained through learning of facts, which includes the risks and benefits of a behavior or action (Sharma & Romas, 2012). Anderson et al. (2013), who investigated the knowledge of colorectal clinicians and their comprehension of the advantages and disadvantages of tackling obesity through

advice on lifestyle change, identified that there was still scope for improving their knowledge, as lack of knowledge was evident. Barely half of the population surveyed was familiar with the guideline for lifestyle advice in their patient population. This lack of knowledge possibly led to poor skill in providing lifestyle advice identified and subsequently the lack of confidence in clinicians (Anderson et al., 2013). Macleod et al. (2013) identified a similar trend among midwives who showed awareness of weight-related problems in pregnancy and the appropriateness of general advice on weight gain but lacked the knowledge of the subject significantly as well as confidence in managing the problem. It identified this as a training need and the need for on-going support was highlighted. Above all the precise definition of the role of midwives as multidisciplinary team members with regards to providing advice on weight management was advocated. A similar pattern was demonstrated by Chang, Llanes, Gold, and Fetters (2013) with professionals waiting until patients gained excessive weight before the issue is addressed.

Self-Efficacy and its Impact on Weight Management Behavior

Strategies identified for achieving self-efficacy are breaking down a behavior or action into smaller achievable steps, using role models' demonstrations, the use of persuasion as well as reassurance, and finally reducing stress (Sharma & Romas, 2012). Self-efficacy reflects the self-belief that one's effort could produce the desired change, and as such, little incentive is needed for the effort to be expended to produce the change (Bandura, 2012). Self-efficacy has positive association with performance accomplishment and an inverse association with emotional arousal (Bandura, 1982).

The poor knowledge of obesity potentially leads to lack of confidence in advising patients on weight management (Anderson et al., 2013). This lack of confidence amounts to poor self-efficacy in advising on weight management, which is essential for any change in action (Sharma & Romas, 2012; Sharma, Wagner, & Wilkerson, 2006). An example of the above is Mahat, Scoloveno, and Ayres, (2013) who investigated HIV/AIDS peer education on a convenience sample of teenagers. Mahat, et al. found knowledge score was positively associated with self-efficacy for limiting risky sexual behaviors. The latter study also highlighted the importance of culturally adapting interventions, which could potentially have influenced the finding as well as the use of convenience sample in the recruitment of participants. The link between knowledge and self-efficacy is further supported by the claim by Welsh et al. (2015) that training primary care pediatric professionals on patient-centered counseling in the area of healthy weight management, does improve their confidence and ability to set goals. In another study where health professionals score themselves poor on the self-efficacy scale, they went on to identify the lack of weight management programs in their locality, patients' motivation, and the lack of involvement of family as barriers to obesity management (Shaikh, Nettiksimmons, & Romano, 2011).

While training professionals on weight management behavior strategies are essential for increasing their knowledge and subsequently self-efficacy, their ability to effectively communicate it to their patient population could be problematic, which further impacts on their self-efficacy in obesity management (Gerards, Dagnelie, Jansen, De Vries, & Kremers, 2012). Healthcare professionals with normal weight are more likely to

talk about weight loss with their patients and have greater confidence in providing dietary and exercise counseling than the overweight/obese professionals (Bleich, Bennett, Gudzune, & Cooper, 2012). The inability of overweight/obese professionals to engage in weight management discussions could be as a result of concerns about patient's perception of their weight. Patients might also be expecting physicians to lead by example. This sense of leading by example could improve self-efficacy as could be seen in Arsenault, Xu, Taveras, and Hacker, (2014). Arsenault et al. highlighted parents' confidence in maintaining weight-related behaviors themselves reflects on their ability to support their children's behavior change with regards to weight gain. Parents who had the capacity to meet their set goals with regards to physical activity, television watching, sleep duration and fast food, were more likely to exhibit high self-efficacy in supporting their children achieve the above-mentioned goals.

Apart from direct counseling of overweight/obese patients regarding weight management behaviors, both motivational interviews and social skills training have also been useful in increasing self-efficacy and subsequent decrease of the BMI scores over a six month period (Walpole, Dettmer, Morrongiello, McCrindle, & Hamilton, 2013). Self-efficacy is an important SCT construct used for predicting behaviors that prevent obesity in childhood and is suggested to be useful also in primary preventive interventions (Sharma, et al., 2006). Higher level of self-efficacy is independently linked with positive outcome expectations and also social support scores (Volkmann et al., 2014). The latter highlights the link between self-efficacy and other constructs of the SCT.

The Possible Roles of Goal Setting on Weight Management Behavior

The ability to set goals and developing plans geared towards accomplishing an action or behavior is an SCT construct that helps ensure change in behavior is made easier. Goals are classically short-term and long-term in nature (Sharma & Romas, 2012). Goal setting demonstrates the cognitive portrayal of outcomes desired, anticipated or preferred by an individual. Goal setting as an SCT construct suggests that individuals learn a behavior, think about it as it applies to the future and identifies the desired outcome as well as develop a plan as to how to achieve the result (Sharma & Romas, 2012). Self-efficacy is a prerequisite for goal setting as there is usually a degree of confidence that goals set will be achievable. Goal setting is a precondition for self-regulation as it provides the objective to be achieved and a benchmark for the assessment of progress.

Applying the concept of goal setting in obesity control is identified as a good strategy for developing interventions to address obesity. Strong and specific goal setting are among the identified features of the effectiveness of interventions, which are targeted towards improving weight-related nutrition and activity (Golley, Hendrie, Slater, & Corsini, 2011). Parents who participated in McKee, Maher, Deen, and Blank's (2010) study expressed frustration they were not offered how to achieve change in behavior geared towards weight management in their children after being offered advice on behavior change. This group of parents was acceptable of a model that would include goal-setting model by healthcare professionals in obesity management. Ries et al. (2014), in their quasi-experimental study, supported the combination of health information and

goal setting support that was more efficient in obesity management in the low-income community compared to only receiving information on obesity. Having a mix of health information and goal setting support increases the likelihood of moving to the action/maintenance stage of improving both their diet and physical activity level from contemplation stage.

The latter finding seems to be contrary to findings of Welsh et al. (2015), where goal setting increased from 3.9% at baseline to 16.9% and 57.6% after 6 months and 12 months respectively after receiving 2-hour counseling on healthy weight management without any goal setting support. It is unclear what could have made such a change in goal setting in the latter knowing the participants got no goal setting support as in Ries et al. (2014). The groups of participants in the Ries, et al. and Welsh et al. differ with regards to their understanding of the problem and motivation to make a change.

It is unclear if the usefulness of goal setting is limited to certain groups with regards to BMI. The lack of clarity about the usefulness of goal setting as mentioned above is because Brown et al. (2012) found goal setting as a component of healthy lifestyle intervention to be useful in achieving optimal weight gain in pregnancy. A theoretically based intervention was rather thought to be best for women who are overweight and obese in achieving optimal weight gain. The likelihood of having weight gain goal increases with modifiable factors, that is, engagement in healthy behavior and the offer of recommendations/guidelines for health providers (Tovar et al., 2011). Maybe with participation in healthy behavior and awareness of recommendation, more insight is

gained into the risks and benefits of such healthy behavior and expectations are raised leading to goal setting.

Expectations as it Applies to Weight Management Behavior

Before engaging in behavior or action, there is usually anticipation of the desired outcome that would follow if the behavior were carried out. The desired outcome, otherwise described as outcome expectation, is developed enactively through experience or learning from others (Sharma & Romas, 2012). According to Bandura (2004), there are three possible outcomes to be expected following engaging in the behavior. These outcomes areas include the following; physical outcome, which comprises of both the good and bad results following a behavior or action, approval or disapproval by peers, and finally self-evaluation, which could be either positive or negative. The outcome expectations could be improved on through education on the behavior of importance; as the expectations increases, the likelihood of acquiring the desired behavior increases (Bandura, 2011; Sharma & Romas, 2012). Outcome expectation is important in making the decision regarding engaging in behavior or action.

Outcome expectation has a positive relationship with self-efficacy (Lowenstein et al., 2013). It showed an increase in confidence in care providers' ability to offer counselling on weight management behavior in their client population led to increase in their expectation of outcome. It was unclear why there was variation between the genders in reporting counselling on obesity; but having resources for weight management behavior increased outcome expectation. Outcome expectation alongside other constructs of SCT positively predicted self-efficacy in a study on mothers' food-related behavior,

yet again demonstrating the links between the constructs (Bryd-Bredbenner, Abbot, & Clussler, 2011). As other factors age and years of experience increases, outcome expectation and self-efficacy increases (Bunch, Robinson, & Edwards, 2012). This finding again could be inferred to be a result of increased knowledge that possibly comes with age and experience. The possible link between self-efficacy, outcome expectation and knowledge is not surprising given the trio have a cognitive influence on behavior (Kedler, Hoelscher, & Perry, 2015). The impact of age and years of experience of mental health professionals in advising on weight management behavior will be important to know to develop adequate policies.

Knowledge may be accountable for variability in beliefs as well as outcome expectation (Edmed & Sullivan, 2014). In as much as Anderson-Bill et al. (2013) did not suggest a relationship between outcome expectation and self-efficacy, both were important predicting factors among the population enrolling in an online intervention aimed at health behavior change. According to Crawford and Glover (2012), outcome expectations does not have a definite relationship with weight loss, regain of weight, attendance as well as dropping from weight loss interventions among the overweight and obese. It is unclear if this finding is a result of the use of varied terminologies for expectations in the studies included in the literature review.

Outcome expectancy is linked to outcome expectation as it describes the value placed on the desired outcome following a behavior or action (Dewar, Lubans, Plotnikoff, & Morgan, 2012; Sharma & Romas, 2012). The values placed on outcome expectation as well as motivational self-efficacy, and the perception of being cared for is

associated with the aim or plans to carry out a physical activity among obese people (Parschau, et al., 2014). The latter was not the case in Bagherniya, Sharma, Mostafavi, and Keshavarz, (2015), who found outcome expectancy alongside with other constructs of SCT nonpredictive of childhood obesity prevention behaviors. The lack of use of culturally appropriate model seems to have impacted on the study outcome, yet again highlighting the need to consider cultural issues in research.

The Roles of Situational Perception in Weight Management Behavior

Situational perception, which describes an individual's perception as well as interpretation of his/her environment, is vital to bringing about a change of behavior (Baranowski, Perry, & Parcel, 2002). This construct of SCT is viewed to be important as any misperception potentially hinders efforts aimed at promoting healthy social norms. The inability to perceive and comprehend elements of the work environment and subsequently make projections affects the accuracy and appropriateness of clinical decision-making (Fore & Sculli, 2013). Making available correct information and explaining it appropriately correct misperception. Also, discussions and lectures are useful in modifying situational perception (Sharma & Romas, 2012).

There were no specific articles found on the role of situational perception as it applies to weight management behavior, and as a result, other studies from different specialties were included to buttress the potential important of situational perception in weight management behavior. The attributes that constitute a hospital work environment as highlighted by Choi, Cheung, and Pang, (2013), are professionalism, relationship with colleagues, management, available resources and staffing, and the set practice/guidelines.

The perceptions of the staff of these attributes are deemed important. One of the things associated with an individual's perception of working environment is job satisfaction, which has the potential to reflect on the quality of work (Lambrou, Merkouris, Middleton, & Papastavrou, 2014; Papastavrou et al., 2014). The job satisfaction of staff following the perception of their work environment does also impact on patients' satisfaction levels (Boev, 2012). Apart from job satisfaction, the perception of environment impacts on task orientation and innovation (Brown, Williams, & Lynch, 2013).

There is a variation in the perception of the environment by health professionals in different settings/locations (McKenzie, Blandford, Menec, Boltz, & Capezuti, 2011; Papastavrou et al., 2014), which may be a result of the nature or contents of the different environments. The variation could be attributable to demographics, cultural differences/issues and the individual health system (Papastavrou et al., 2012). There is variation in the perception of the work environment according to the hierarchy of staff with managers having higher scores on their perception of the workplace (Gormley, 2011). It is unclear why the difference is, though those with low satisfaction might have left the profession, leaving only those with higher satisfaction. As a result of the finding of Gormley (2011), junior staff would need support in such circumstances to achieve job satisfaction with resultant improvement in the quality of work they offer.

Summary

Obesity remains a public health problem and it is an even greater concern in the mentally ill population given the additional risks associated with their prescribed

medications and their illness, with regards to weight gain. Because of the high prevalence of obesity among persons with mental illness, it has become a vital topic that needs continuing studying. It is even more important especially given that one in four of the UK population suffers from a mental health problem in their lifetime. The management of obesity in the mentally ill population is more challenging, as mentally ill people seem to reside in the obesogenic environment, which could explain their increased mortality and morbidity rates, reduced life expectancy and quality of life. There was no study found that investigated the management of obesity by the mental health professionals and why the challenges they face in managing weight gain or obesity in their patient population.

The literature found based on the five constructs of SCT of interest, that is, knowledge, expectations, self-efficacy, goal setting and situational perceptions suggests an interaction between the constructs in predicting behaviors. Other factors such as age, years of experience, motivational interviews, the weight of professionals, gender, and social skills have an impact on weight management behaviors. There is no study on situational perception with regards to weight management but the attributes that constitute health environment are professionalism, relationship with work colleagues, management, resources available including staffing, and the set of practice and guidelines. Situational perception is associated with job satisfaction, and there is variation in the perception of work environment by staff in different locations and among different hierarchies of staff, which could be attributable to demographics, cultural differences, and the health system.

The findings from this literature review have highlighted the need for SCT constructs in behavior change and particularly as these apply to weight management. As such, the link between the SCT constructs as mentioned earlier will be investigated in the management of obesity among psychiatry professionals as well as confirming or disproving the associations highlighted above. The findings from the study will help fill the gap identified following literature review, contribute to existing body of evidence, form the basis for further research in the area as well as bringing about positive change in professionals' weight management behavior.

Chapter 3: Research Method

Introduction

This chapter is an explanation of the methodology applied in my research study, which was aimed at identifying the predictors of WMAB among mental health professionals in the Dudley and Walsall Mental Health Partnership Trust, United Kingdom. The chosen study design and the rationale for its use in the study is outlined in the first section. The second section of this chapter includes a description of the study population, sampling method, procedure for the recruitment of participants, instrumentation, data analyses and management. The final section is a definition of the ethical considerations as well as potential threats to validity.

Research Design and Rationale

Cross-sectional study was chosen to answer the research questions as well as test the hypotheses. The use of cross-sectional study design was appropriate given the research study was nonexperimental in nature just as prospective study design. The latter could not be used given time limitations for the dissertation. The study involved the surveying of a population of mental health professionals over a given period for the purpose of estimating the prevalence of the identified problem, which is a criterion for cross-sectional study design (Frankfort-Nachiams & Nachmias, 2008; Levin, 2006; Woodward, 2013). Similar studies aimed at predicting weight gain prevention and or control utilized cross-sectional study designs (Macleod et al., 2013; Sharma, Wagner, & Wilkerson, 2006). The use of cross-sectional study design was all the more important in the study as it is useful for the description of association patterns between variables

(Frankfort-Nachiams & Nachmias, 2008). The cross-sectional study design does not confer causality, but because it generates useful data, inferences could be made from the obtained data (Woodward, 2013). The cross-sectional study design is useful for generating hypotheses for further testing possibly using experimental design (Levin, 2006).

Cross-sectional studies have some important advantages such as taking place in natural settings, which increases the external validity of such research, especially with probability samples. It is an alternative to experimental studies when there are ethical issues with regards to assigning participants to study groups (Frankfort-Nachiams & Nachmias, 2008). It is easy to carry out given there will be no randomization of participants to groups, and there is no follow-up, all of which potentially give rise to the low cost associated with cross-sectional study design (Creswell, 2013). As a result of no follow-up need, attrition bias is avoided. Because cross-sectional studies generate a lot of information, there is the possibility to assess a lot of outcomes as well as risks factors (Levine, 2006). Cross-sectional studies have proved vital in public health policy development and planning (Babbie, 2015).

The use of cross-sectional study design predisposes to some limitations. One of such limitations is its inability to establish a cause-effect relationship (Campbell & Stanley, 1963; Creswell, 2013; Frankfort-Nachiams & Nachmias, 2008; Levin, 2006; Woodward, 2013). There could be differences in outcome if the same methodology applies to the same population in another time frame. The periods before and after the snapshot are not taken into consideration. The latter is helpful in the explanation of the

study findings. It could be problematic to generalize the findings of cross-sectional studies as a result of the likelihood of poor representativeness of the general population, which stems from the lack of randomization of the participants (Creswell, 2013; Frankfort-Nachiams &Nachmias, 2008; Levin, 2006).

One of the reasons for choosing cross-sectional study design was because I set out to describe the association between the SCT constructs – knowledge, situational perception, self-efficacy, goal setting and expectations and WMAB in the mental health professionals. As the extent of the WMAB in mental health professionals is relatively unknown, the use of cross-sectional study design was deemed a good first step for highlighting the scope of the problem. The moderating effects of gender, professional group, age, the number of years of practice, previous training on weight gain prevention/control and ethnicity were tested. Given I had limited time to carry out a research work on my dissertation; a cross-sectional study was easier for me to undertake compared to an experimental study. Financial constraint given I self-funded my study at the Walden University means that cross-sectional study was appropriate as it is less costly compared interventional study design.

Study Variables

Variables can be both observed and measured (Creswell, 2013). Variable could represent the characteristics of an individual or even object, has attributes or qualities and also varies (Babbie, 2015); for example, some healthcare workers could be knowledgeable in weight management while others would not be knowledgeable in weight management. Variables are dependent variable, independent variable or

moderating variables (Creswell, 2013). The dependent variable otherwise known as outcome variable is dependent on the independent variables otherwise known as explanatory variable or predictor variable as the case may be. The dependent variable for the study was WMAB. The independent variables were the five chosen SCT constructs, which are, knowledge, situational perception, expectations, self-efficacy, and goal setting. The moderating variables are variables that have an influence on the link between the dependent and independent variables. For the study, moderating variables of importance are gender, age, previous training on weight management, professional group, the number of years of practice, directorate/area of practice and ethnicity.

For logistic regression, WMAB measured as binary was the dependent variable and the SCT constructs independent variable and for multiple regression, WMAB measured on a continuous scale was the dependent variable and the SCT constructs also measured on continuous scale as the independent variables. The differences between various professional groups (Research Question 6) was tested using MANOVA, with the SCT constructs measured on a continuous scale as dependent variable and the independent variables the professional groups which are categorical.

Methodology

Population

I surveyed frontline professionals inclusive of nurses, doctors, occupational therapist, social workers, and psychologists caring for persons with mental illness in the Dudley and Walsall Mental Health Partnership Trust, United Kingdom. The survey was carried out over a 2-month period. The trust has over 350 employees working in the

above-mentioned professional groups spread over the two locations. I had series of discussions with the Research and Development Manager, and further met with the clinical governance team, which includes the medical director of the Trust to discuss the study. The trust accepted to host the study on the condition that appropriate ethical approval was obtained before data collection. The NREC approval was not required, rather the Health Research Approval (HRA) was sought because the population to be used work in the NHS. The HRA ethics approval was obtained. The IRB approval was sought and obtained.

Sample and Sampling Procedure

There was no sampling of participants for the study as every nurse, doctor, occupational therapist, social workers and psychologist were expected to participate. The differences in the professionals' background as well as other potential differences were accounted for during analysis using statistical modeling – logistic regression. Variables were entered in the multiple regression models using stepwise regression. Not all the professionals in the group mentioned were able to take part for several reasons. It was anticipated that a large number would be taking part in the study. For the fact the study is a cross-sectional study that investigated associations between and among variables, multiple linear regression was used in its analysis. Using the G*Power 3.1 and the following indices; Test family - *F* tests, statistical test - Linear multiple regression: Fixed model, R^2 deviation from zero, Effect size = 0.10 (medium), $\alpha = 0.05$, Power = 0.8, Number of predictors = 5 (five constructs of the social cognitive theory to be investigated), the sample size that would confer medium effect size was calculated to be a

total of 134 participants. The choice of an effect size of 0.10 was based on the fact that there was no previous data to justify medium effect size. I had a target of more than 134 respondents for the study. The data collection was expected to last for not more than a month.

A full list of the number of professionals employed by the trust was obtained from the human resources department with the view to establish the exact number of professionals in each of the professional groups. The trust was contacted and facilitated the above. The full list of professionals both served as the sampling frame though there was no random sampling of participants and also helped in the calculation of weight to be assigned to each of the groups in the analysis. The latter was important, as there was the likelihood that a professional group will be over-represented or under-represented, which could impact on the validity of the study (Frankfort-Nachiams & Nachmias, 2008).

Procedure for Recruitment, Participation, and Data Collection

In recruiting participants for the study, an initial e-mail was sent out to the frontline professionals in the field of interest as already mentioned above to introduce the study to them. The benefits of the study and the assurance of steps to be taken to ensure confidentiality and anonymity were also highlighted. The above was followed up with the distribution of questionnaire (WMABS), developed for the study as hard copy and via email with the consent form attached. The questionnaire contains general information that include gender, age, previous training on weight management, professional group, the number of years of practice, ethnicity, height, and weight. The questionnaire also

contained questions on the five SCT constructs of interest, namely knowledge, situational perception, expectations, self-efficacy, and goal setting.

After a week of sending out the questionnaire via e-mail, reminder e-mail was sent out as well as another questionnaire in case the first one was not received. I also attended the different hospital sites, team meetings and professionals' meetings in the case of doctors to hand the questionnaires physically out for participants to fill and hand back in. The use of a combination of e-mail and self-administered modes of questionnaire administration ensured a reasonable respondent rate. The latter was because the e-mail mode of questionnaire administration classically has low respondent rate as a limitation, which potentially could affect the validity and reliability of the study (Creswell, 2013; Frankfort-Nachmias & Nachmias, 2008). The self-administered mode of questionnaire administration was also necessary as there might be participants who might have problems with technology and as such need alternative method of responding to the questionnaires. There was no input from me to ensure all participants are treated equally. Questionnaires were returned using designated collection boxes in the various units/wards and receptions to ensure anonymity.

The second and third reminders were sent out after 1 week of the first reminder and a week after the second reminder respectively. There were no incentives given to participants as this have been controversial and potentially could affect the responses of participants. Participants were made aware of the fact that the findings of the study will be made available to them through the Research and Development department of the

trust. I will be presenting the study findings at the end of the study in professionals' meetings within the Trust.

Ethics

Substantial attention was paid to ensuring that the ethical standards and protocols of both Walden University and the NHS were adhered to. First and foremost, ethical approvals were sought and obtained from the HRA as the Trust hosting the study is based in the UK and is part of the National Health Service. Following this further ethical approval was sought from the Institutional Review Board (IRB) before data collection. Seeking ethical approval is in line with the required standards for researchers. According to Rudestam and Newton (2014), these standards include researcher ensuring the research to be carried out is valid, beneficial to the population being targeted, participants to have the choice to take part or not, informed consent to be sought from potential participants and the researcher must be competent to carry out the study. I attempted to meet all the above-mentioned standards in the study.

Consent was sought from the Research and Development department of the Trust who in conjunction with the clinical governance group agreed for the study to be carried out on their employees on the condition that ethical approval must be obtained. Consent was sought from the participant by distributing consent form alongside the questionnaire via email. Consent was assumed if participant fills out and returns questionnaire. There were no sensitive questions in the questionnaire that has the potential to harm the participants. Information about the study, its benefits, steps for ensuring anonymity and

confidentiality were explained to potential participants via an email before the distribution of questionnaires.

Instrument and Operationalization of Constructs

All data were collected using a self-reported questionnaire that contained demographic details and five subscales of SCT constructs of interest, that is, knowledge, situational perception, expectations, self-efficacy, and goal setting as well as WMAB. This WMABS) was developed by me and my mentor solely for the study (Appendix A). It was validated for face and content validity by a panel of six experts (Appendix B).

In developing WMABS, the clear definition of the purpose of its development that was primarily to assess the applicability of SCT constructs in weight management behavior advice behavior among mental health professionals was established. The above is important, as SCT constructs have been used in previous studies in different populations to successfully predict weight management-related behaviors (Annesi, Unruh, Marti, Gorjala, & Tennant, 2011; Sharma et al., 2004).

The SCT constructs of interest were operationalized, and scales of the measurement for each subscale determined. Questions for each subscale were framed in such a way to ensure precision and clarity. A further test for readability was done and adjustments made to reflect the target population. Drafts of the questionnaire were reviewed by my committee chair after which it was sent out to a panel of six experts including three in psychiatry for face and content validation. The questionnaire was revised based on feedbacks from the experts from at least two rounds of review. The readability, the amount of time taken to fill out the questionnaire, comprehension and

other related issues using a pilot test in a sample of the psychiatry healthcare professionals in Manchester Metal Health and Social Care Trust were tested. Subsequently, internal consistency and test retest reliability analysis were done to establish reliability. It showed strong test retest reliability, $r = .93$, $p < .001$, and there was strong internal consistency of the WAMBS, ($\alpha = .94$). The scale was not altered following the pilot study.

Operationalization of Variables

Knowledge refers to the understanding of the mental health professionals of obesity, its associated complications and potential strategies for addressing the problem. Knowledge of obesity was explored using a ten-item knowledge scale. Questions on knowledge will be answered using a True or False format (0 = False; 1 = True). The summated score ranged from 0 to 10.

Expectations subscale was inclusive of both outcome expectations, which refers to the anticipated outcome following weight management advice and outcome expectancies, which refers to values placed on the likely outcome. The expectations subscale is a 10-item scale made up of five questions each of outcome expectations and outcome expectancies. The questions on outcome expectations were rated using five-point Liker–type scale (0 = *Never*, 1 = *Hardly Ever*, 2 – *Sometimes*, 3 = *A Lot*, and 4 = *Almost Always*). The questions on outcome expectancies were rated as well using five-point Likert scale type scale (0 = *Not important* At All, 1 = *Not Important*, 2 = *Somewhat Important*, 3 *Important,* and 4 = *Very important*). The ratings for both expectation

outcomes and expectancies were multiplied and summed up. The expectations score ranged from 0 to 80.

Self-efficacy subscale is a six-item scale with questions exploring mental health professionals' confidence in advising their patients on weight management behaviors. The questions were rated using five-point Likert-type scale (0 = *Really Unsure*, 1 = *Sort of Unsure*, 2 = *Somewhat Sure*, 3 = *Sort of Sure,* and 4 = *Really Sure*). The Self-efficacy score ranged from 0 to 24.

Goal setting subscale explored the ability of mental health professionals to set goals and develop plans geared towards advising their patient population on weight management behaviors. The eight-item Goal setting sub-scale was rated using five-point Likert-type scale (0 = *Really Unsure,* 1 = *Sort of Unsure,* 2 = *Somewhat Sure,* 3 = *Sort of Sure*, and 4 = *Really Sure*). The self-efficacy score ranged from 0 to 32.

Situational perception refers to the circumstances that surround mental health professionals, which potentially could impact on their ability to advise their patients on weight management behavior. These circumstances could be physical or social in nature. The environment subscale is a four-item scale measured using five-point Likert-type scale (0 = *Never,* 1 = *Hardly Ever,* 2 – *Sometimes,* 3 = *A Lot,* and 4 = *Almost Always*). The environment score ranged from 0 to 16.

WMAB refers to the ability of healthcare professionals to effectively advice on weight management. This subscale of the questionnaire is a four-item scale measured using five-point Likert type scale (0 = *Never,* 1 = *Hardly Ever*, 2 – *Sometimes,* 3 = *A Lot,* and 4 = *Almost Always*). The WMAB score ranged from 0 to 16.

Advising on weight management in the last 7 days refers to the probability of health care professionals advising their patient group on weight management 7 days leading up to the survey. Question on advising on weight management in the last 7 days' was answered using a True or False format (0 = False; 1 = True). The summated score ranged from 0 to 1.

Data Analysis Plan

Data collected from participants was inputted into SPSS, which was the software of choice for the analysis of the obtained data. SPSS was used in cleaning up data prior to analyses. The descriptive analyses of the data were carried out with specific emphasis on measures of central tendency, the normality of distribution and frequency distribution for discrete variables. The independent and dependent variables were assessed using ANOVA, Pearson's and Biserial correlations and Chi^2 with the demographic and other baseline variables (age, BMI, and years of practice) to identify potential confounding variables. These were presented using tables and figures. Both multiple regression and logistic regression analyses were used for predicting WMAB among mental health professionals. The ability of the independent variables to predict WMAB and *advising on weight management in the last 7 days* were initially determined without controlling for potential confounding factors. The ability of the independent variables to predict WMAB and *advising on weight management in the last 7 days* were subsequently controlled for using gender and profession; and gender respectively. The results were presented using tables.

Research Questions 1- 5 were assessed using simple linear regression, multiple regression and logistic regression models that assessed knowledge, expectations, self-efficacy and situational perception as independent variable and WMAB as dependent variable. Advising on weight management behavior in the last 7 days, measured with a binary outcome was the dependent variable and the SCT constructs independent variables for the logistic crude and adjusted models. The logistic regression predicted if SCT constructs of interest could predict WMAB in the last 7 days. The WMAB measured on a continuous scale was the dependent variable for the multiple linear regression analysis with the SCT constructs as the independent variables. MANOVA was used in answering research question 6 and the dependent variables was the SCT constructs measured on a continuous scale and the independent variables the professional groups which are measured on a nominal scale. Standardizing the independent variables, merging the variables, or obtaining more data rather than dropping highly correlated variables were planned to be strategies for dealing with potential multicollinearity. The results were presented and interpreted using the appropriate indices from the above mentioned statistical analyses methods.

Data Management

I used a primary data obtained for the purpose of the study. It was expected that participants would able to complete all the questions accurately. To make it easy for participants to respond, the instructions on the questionnaires were very clear and precise to avoid any confusion or misunderstanding of questions. I had a look at all the questionnaires collected to identify any problems and thereafter inputted the data into

SPSS. Further crosschecking of the inputted data to ensure it reflects the responses on the questionnaires, was done by the researcher and a member of the Research and Development department. The latter served as a way of cleansing the dataset.

Regarding the confidentiality, the data obtained were stored in a Trust encrypted disc and was only be accessible to the designated Trust Research and Development (R&D) representative for the project and me. A code is needed to view the contents of the disc. The participants were anonymized using numbers or alphabets or a combination of both to avoid easy recognition of participants. The anonymization was done with the help of the R&D department. The steps were taken to ensure confidentiality was taken seriously to ensure high ethical standards (Mills, Duepos, & Wiebe, 2009; Rudestam & Newton, 2014).

Research Questions and Hypotheses

RQ1. To what extent does the knowledge of weight management behavior influence WMAB among mental health professionals?

H_0: knowledge has no statistically significant association with WMAB among mental health professionals.

$H_{1:}$ knowledge has a statistically significant association with WMAB among mental health professionals.

RQ2. To what extent does the work environment (situational perception) influence WMAB among mental health professionals?

H_0: Health professionals' work environment (situational perception) has no statistically significant association with WMAB among mental health professionals.

$H_{1:}$ Health professionals' work environment (situational perception) has a statistically significant association on WMAB among mental health professionals.

RQ3. To what extent does self-efficacy in offering advice on weight management behavior influence WMAB among mental health professionals?

H_0: Self-efficacy has no statistically significant association with WMAB among mental health professionals.

$H_{1:}$ Self-efficacy has a statistically significant association with WMAB among mental health professionals.

RQ4. To what extent do expectations (outcome expectancies and outcome expectations) influence WMAB among mental health professionals?

H_0: Healthcare professionals' expectations have no statistically significant association with WMAB among mental health professionals.

$H_{1:}$ Healthcare professionals' expectations have a statistically significant association with WMAB among mental health professionals.

RQ5. To what extent does goal-setting abilities of mental health professionals influence their WMAB?

H_0: The ability of healthcare professionals to set goals has no statistically significant association with WMAB among mental health professionals.

$H_{1:}$ The ability of healthcare professionals' to set goals has a statistically significant association with WMAB among mental health professionals.

RQ6: Is there any statistically significance difference among the professional groups with regards to Knowledge, Self-efficacy, Goal setting, Situational perception and Expectations scores?

H_0: There is no statistically significant difference in Knowledge, Self-efficacy, Goal setting, Situational perception and Expectations scores based on the professionals group.

H_1: There is a statistically significant difference in Knowledge, Self-efficacy, Goal setting, Situational perception and Expectations scores based on the professionals group.

Threats to Validity

There are potential sources of threats to validity in any research need to be identified and addressed as appropriate (Rudestam & Newton, 2014). In this study, the lack of randomization in the recruitment of participants has the possibility to impact on the external validity of the study. The impact on validity stems from the likelihood that the population of interest might not be well represented, as certain professional groups might be underrepresented or overrepresented. I addressed this problem by weighting the different professional groups participating in the study before the analysis of the obtained data. The latter to an extent would help when generalizing the finding of the study though the lack of generalizability of findings has always been a problem with cross-sectional studies (Creswell, 2013).

With the content validity and face validity of the questionnaire being determined by a panel of six experts respectively, problems with internal validity will be limited. Effort were made to allow all the participants using either email or self-administered

modes of survey fill out the forms to the best of their abilities without interfering. The instructions in the questionnaire as well as the questions were very clear and precise to ensure no need for interference.

Summary

The study was carried out using cross-sectional study design. The target population was mental health professionals employed by the Dudley and Walsall Mental Health Partnership NHS Trust, UK. There was no sampling of participants into the study rather all mental health professionals working in the capacity of nurse, doctor, occupational therapist, psychologist and social worker were included. The calculated sample size for the study was 134 participants. Walden University and the NHS approvals were obtained from both bodies before the study commenced. Attention was paid to ethical issues as recommended. One questionnaire comprising of general information questions and question on knowledge, situational perception, expectations, self-efficacy and goal setting was used. The obtained data wer analyzed using the SPSS 23.

Chapter 4: Results

Introduction

The aim of this study was to predict the WMAB of psychiatry professionals using SCT. The study set out to test the relationships between five constructs of SCT, namely knowledge, expectation, self-efficacy, situational perception, and goal setting with WMAB. The possible predictors of ability of health professionals to advice on weight management in the previous seven days were tested. I tested the differences in WMAB among the different professional groups, namely; nurses, psychologists, occupational therapists, doctors, support workers, and social workers.

In this result chapter, the findings of the current study are presented. The first section of the chapter provides the process of data collection as well the operationalization of variables used in the study. The second section provides information on the descriptive statistics and the inferential analyses results for each of the six research questions, which used linear regression, multiple linear regression, logistic regression and multivariate analysis of variance. These analyses were done using the SPSS Version 23. A summary of the chapter is the third and final section.

Data Collection

The steps for questionnaire distribution as highlighted in the methodology section in Chapter 3 were adhered to strictly. The questionnaire was distributed to 777 healthcare professionals in the six professional groups of interest through the communication department of the Trust. Further 405 hard copies of the questionnaire were distributed to maximize participation. Of the 164 respondents, three were from the online survey and

161 responded following the hard copy distribution. The three responses from the online distribution were returned via the communications department who forwarded the completed questionnaire to without details of participants. The hard copies were filled out and posted in the blue boxes in the various units/wards. The 164 questionnaires returned accounts for 21% of the study population. General information about the participants, such as, gender, previous training on weight gain, profession, department/specialty, ethnicity, age, number of years of practice, weight, and height were also collected using the questionnaire as well as questions on the aforementioned constructs of SCT, knowledge, self-efficacy, situational perception, expectations, and goal setting which all formed the subscales of the scale.

The variables gender, previous training on weight gain, profession, ethnicity, and department/specialty were all measured on categorical scale, while age, number of years of training, weight, height, BMI were measured on continuous scale. The questions on the five constructs of SCT, which utilized Likert scale for the responses, were measured on continuous scale. The last question in the questionnaire exploring if professionals had advised patients on weight management in the last week was measured on a categorical scale. All the data collected were inputted into SPSS promptly with the view to have the data ready for analysis in good time.

The total of 164 participants exceeded the calculated sample size for the study (134). With the questionnaires being distributed to the two locations of the Trust as well as both the inpatient and community teams increases the likelihood of the participants being representative of the professionals in the Trust.

Results

Table 1 below highlights the characteristics of the study participants with regards to their gender, previous training on weight gain, profession and race. 7(4.3%) out of the 164 participants did not identify their gender; but, 73(44.5%) of the participants were males and 84(51.2%) females. Majority 127(77.4%) of the participants had had no previous training on weight gain. Psychologists 4(2.4%) were least represented compared to nurses 72(43.9%) who were in the majority. White professionals accounted for 51.% of the participants with Black and Asian accounting for 25(15.2%) and 21(12.8%) respectively.

A majority, 128 (78%), of the participants was working in the General Adult psychiatry specialty with employers in the Child and Adolescent mental health service (CAMHS) having the lowest participation rate of 1 (0.6%). Old age professionals were 10 (6.1%) and 25 (15.2%) participants did not indicate their specialty. The mean age of the participants was 40.3 years and the average years of practice was 12.9 years. The participants were overweight with a mean BMI of 25.88.

Table 1

Participant Sociodemographics

Total Population (*n*-=164)		Frequency (*n*)	Percentage (%)	Percentage (%)
Sex				
	Male	73	44.5	44.5
	Female	84	51.2	51.2
	Missing	7	4.3	4.3
Previous training on weight management				
	No	127	77.4	77.4
	Yes	26	15.9	15.9
	Missing	11	6.7	6.7
Profession				
	Nurses	72	43.9	43.9
	Psychologists	4	2.4	2.4
	Occupational therapists	7	4.3	4.3
	Doctors	40	24.4	24.4
	Support workers	25	15.2	15.2
	Social workers	13	7.9	7.9
	Missing	3	1.8	1.8
Race				
	Asian	25	15.2	15.2
	Black	21	12.8	12.8
	White	84	51.2	51.2
	Mixed race	2	1.2	1.2
	Other	3	2.2	2.2
	Missing	29	17.7	17.7
Specialty				
	CAMHS	1	0.6	0.6
	Old Age	10	6.1	6.1
	General Adult	128	78	78
	Missing	25	15.2	15.2

	N	Range	Mean	Standard Deviation
Age	154	19-76	40.30	11.2
Years in Practice	156	0-37	12.9	8.9
BMI	141	16.30-41.34	25.88	4.35

Child and adolescent mental health service (CAMHS)

Table 2 below shows the proportion of participants based on the total of each professional groups employed by the Trust at the time of the study. The proportion of doctors who participated in the study was the highest among all the professional groups. Though nurses are the largest employed by the Trust with a total of 369 and only 72 (19.51%) of them took part in the study. 40 (48.19%) of the doctors out of a total of 83 doctors employed by the Trust.

Table 2

Professional Group Representation Based on Total Number Employed by the Trust

Profession	Total Employed	Total Participating *n* (%)
Nurse	369	72 (19.51%)
Psychologist	44	4 (0.1%)
Occupational Therapist	27	7(25.92%)
Doctor	83	40(48.19%)
Support worker	174	25(14.36%)
Social worker	80	13(16.25%)

The descriptive statistics of the SCT constructs of interest obtained from the 164 participants is summarized in Table 3 below. The range of scores with regards to knowledge was 0 to 10, and the mean score among the participants was 8.75. For expectations, the mean score was 47.76, while its score ranged from 0 to 80. The scores for situational perception ranged from 0 to 16 and the mean score among participants was 7.28. The mean score of self-efficacy was 14.39. Self-efficacy score ranged between 0 and 24. The lowest possible score for goal setting was 0 and the maximum 32. The participants score an average of 20.74 for goal setting. Finally, WMAB had a lowest score of 0 and maximum of 16. The participants mean score for WAMB was 10.33.

Table 3

Descriptive Statistics

	N	Range	Mean	Standard Deviation
Knowledge	164	0 – 10	8.75	2.11
Expectations	164	0 – 80	47.76	14.07
Situational Perception	164	0 – 16	7.28	2.97
Self-Efficacy	164	0 – 24	14.39	6.00
Goal Setting	164	0 – 32	20.74	7.91
WMAP	164	0 – 16	10.33	3.61

With the true column in Table 4 below having larger figures in comparison to the false column, it suggests that most of the participants were right in their responses to the questions about their knowledge of excess weight and obesity. A total of 158 respondents responded accurately to Question 10, which suggests their knowledge of cost of weight-related problems in the NHS. The participants showed great expectations with regards to the outcome they expect when advising their patient groups, with majority having expectations *sometimes* and *a lot* of the times. Most participants rated the value they place on their expectations (outcome expectancies) as *important* or *very important.*

The word *sometimes* was used more than *never and hardly ever* in answering the questions regarding participants' perception of their working environment and how it impacts on their WMAB. Their responses regarding self-efficacy were evenly spread between *somewhat sure, sort of sure,* and *really sure.* There is a more even spread between *sort of unsure, somewhat sure, sort of sure*, and *really sure* with regards to the frequency of their responses on goal setting. Most of the participants reported the WMAB

questions as *sometimes, a lot,* and *almost always.* Tables 5-10 contain participant responses to additional questions.

Table 4

Knowledge Responses

	False	True
1. Weight-gain among people who suffer from mental illness is a public health problem.	26(16.35)	133(83.65)
2. Weight-gain prevalence is higher in people who suffer from mental illness compared to the general population.	28(17.61)	131(82.39)
3. A combination of factors including biological, environmental and social factors cause weight-gain in people who suffer from mental illness.	7(44.3)	151(95.57)
4. Psychotropic medications are a potential factor in the cause of weight-gain in people who suffer from mental illness.	7(44.3)	151(95.57)
5. Weight-gain increases the likelihood of chronic diseases in people who suffer from mental illness compared to the general population.	27(17.2)	130(82.8)
6. Weight-gain is preventable in people who suffer from mental illness.	19(11.95)	140(88.05)
7. Dietary control is one of the evidence-based strategies for preventing and controlling weight-gain in people who suffer from mental illness.	15(9.5)	143(90.5)
8. Increasing physical activity is one of the evidence-based strategies for preventing and controlling weight-gain in people who suffer from mental illness.	10(6.25)	150(93.75)
9. Appropriate consideration of psychotropic medication choice is helpful in preventing and controlling weight-gain in the mentally ill.	11(6.92)	148(93.08)
10. The cost of weight-related problems has increased in the National Health Service (NHS).	3(1.86)	158(98.14)

Table 5

Outcome Expectation

	Never	*Hardly Ever*	*Sometimes*	*A Lot*	*Almost Always*
11. Advising mentally ill patients on weight management behaviors can reduce the risk of developing adverse conditions associated with weight gain.	1 (0.6)	2 (1.2)	79 (48.2)	52 (31.7)	30 (18.3)
12. If patients with mental illness adhere to weight management advice, their physical health will improve.	1 (0.6)	0 (0)	46 (28)	84 (51.2)	32 (19.5)
13. Offering mentally ill patients weight management advice can help them control their weight.	1 (0.6)	1 (0.6)	77 (47)	64 (39)	20 (12.2)
14. Advising mentally ill patients on weight management behavior can increase their life expectancy.	1 (0.6)	1 (0.6)	69 (42.1)	64 (39)	28 (17.1)
15. Advising mentally ill patients on weight management behavior can reduce the cost of weight-related illness.	1 (0.6)	3 (1.8)	64 (39)	66 (40.2)	29 (17.7)

Table 6

Outcome Expectancies

	Not Important At all	*Not Important*	*Somewhat Important*	*Important*	*Very Important*
16. How important is the reduction of the risks of diseases associated with weight gain to you?	0 (0)	0 (0)	14 (8.5)	59 (36)	91 (55.5)
17. How important is it to you that your patient feels better physically?	0 (0)	0 (0)	3 (1.8)	39 (23.8)	122 (74.4)
18. How important is it to you that your patient controls his/her weight?	1 (0.6)	2 (1.2)	22 (13.4)	72 (43.9)	67 (40.9)
19. How important is it to you that your patient's life expectancy is improved?	1 (0.6)	0 (0)	4 (2.4)	37 (22.6)	122 (74.4)
20. How important is it to you that the cost of treating weight-related illnesses is reduced?	1 (0.6)	5 (3)	24 (14.6)	67 (40.9)	67 (40.9)

Table 7

Situational Perception

	Never	*Hardly Ever*	*Sometimes*	*A Lot*	*Almost Always*
21. Advising mentally ill patients on weight management behavior is encouraged in the Trust.	4 (2.4)	20 (12.2)	69 (42.1)	47 (28.7)	21 (12.8)
22. There is enough time available in my daily work schedule to advise mentally ill patients on weight management behavior.	11 (6.7)	36 (22)	84 (51.2)	21 (12.8)	12 (7.3)
23. There are enough resources to facilitate advising mentally ill patients on weight management behavior.	10 (6.1)	66 (40.2)	66 (40.2)	16 (9.8)	4 (2.4)
24. There are Trust policies for advising mentally ill patients on weight management behavior.	25 (15.2)	38 (23.2)	56 (34.1)	23 (14)	7 (4.3)

Table 8

Self-Efficacy to Advice Patients on Weight Management

	Really Unsure	*Sort of Unsure*	*Somewhat Sure*	*Sort of Sure*	*Really Sure*
25. I have a good knowledge base to advise mentally ill patients on weight management behavior.	9 (5.5)	10 (6.1)	49 (29.9)	64 (39)	30 (18.3)
26. I feel comfortable discussing weight management behavior with my mentally ill patients.	5 (3)	15 (9.1)	38 (23.2)	63 (38.4)	41 (25)
27. I can advise mentally ill patients on weight management behavior even when pressured with time.	14 (8.6)	24 (14.6)	72 (43.9)	32 (19.5)	20 (12.2)
28. I can advise mentally ill patients on weight management behavior even when I'm tired from work.	11 (6.7)	24 (14.6)	50 (30.5)	47 (28.7)	30 (18.3)
29. I can advise on weight management behavior even without colleagues support	15 (9.1)	16 (9.8)	37 (22.6)	57 (34.8)	37 (22.6)
30. I can advise mentally ill patients on weight management behavior even when they have medical health issues to address	21 (12.8)	21 (12.8)	37 (22.6)	57 (34.8)	25 (15.2)

Table 9

Goal Setting

	Really Unsure	*Sort of Unsure*	*Somewhat Sure*	*Sort of Sure*	*Really Sure*
31. Addressing obesity issues in my counselling of patients is a goal of mine	8 (4.9)	27 (16.5)	49 (29.9)	50 (30.5)	27 (16.5)
32. I intend to counsel my patients about their weight.	8 (4.9)	32 (19.5)	42 (25.6)	48 (29.3)	31 (18.9)
33. I intend to counsel my patients about their diet.	6 (3.7)	23 (14.0)	39 (23.8)	59 (36)	33 (20.1)
34. I intend to counsel more of my patients about their physical activity.	8 (4.9)	14 (8.5)	30 (18.3)	74 (45.1)	35 (21.3)
35. It is my goal to address weight with patients along with their mental health issues.	6 (3.7)	21 (12.8)	34 (20.7)	65 (39.6)	36 (22)
36. It is a goal of mine to become more comfortable talking to patients about their weight.	5 (3)	14 (8.5)	32 (19.5)	63 (38.4)	47 (28.7)
37. It is a goal of mine to become more comfortable talking to patients about their diet.	5 (3)	14 (8.5)	33 (20.1)	63 (38.4)	46 (28)
38. It is a goal of mine to become more comfortable talking to patients about their physical activity.	6 (3.7)	11 (6.7)	28 (17.1)	62 (37.8)	54 (32.9)

Table 10

Weight Management Advice Behavior

	Never	*Hardly Ever*	*Some-times*	*A lot*	*Almost Always*
39. I advise my patient on weight management	7 (4.3)	13 (7.9)	77 (47)	40 (24.4)	25 (15.2)
40. I discuss potential weight-gain as a side effects of psychotropic medications	9 (5.5)	15 (9.1)	32 (19.5)	62 (37.8)	44 (26.8)
41. I advise my patients on dietary modifications	7 (4.3)	9 (5.5)	64 (39)	55 (33.5)	27 (16.5)
42. I advise my patients on the need for increased activity levels	5 (3)	5 (3)	43 (26.2)	72 (43.9)	37 (22.6)
43. In the last 7 days, I have offered a weight management advice to a mentally ill patient				False 74 (46.54)	True 85 (53.46)

Table 11 below shows the demographic representation of the 164 participants involved in the study by professional group. Gender ($p < .001$) differences by professional group were found significant. Among nurses in the study, slightly more females 33 (52.5%) participated than males 33 (48.5%). There were differences in the gender proportion of the other professional groups. There were more males 30 (76.9%) among the doctors when compared to 9 (23.1%) who were females. On the other hand, support workers and social workers had more females 15 (65.2%) and 9 (69.2%) respectively when compared to their male group

There were significant race *(*$p < .001$) differences among the professionals who participated in the study. The professional group more prevalent among Asian professional was doctor 18 (60%); but, there were no Asian nurses and psychologists. While there were 10 (17.2%) Black nurses, there was no psychologist self-identifying as Black, and one each self-identified as Black among the occupational therapists and

doctors. Blacks represented 4 (30.8%) and 4 (16.7%) each among the social workers and support workers who participated in the study. Whites had the highest number of nurses with 47 (81%) of the nurses in the study There were no professionals of mixed race origin among the psychologists, occupational therapists, support workers and social workers. Mixed race had one (1.7%) nurse and 1(3.3%) doctor. Those who described their origin as 'other' had no representation in all the professional groups apart from the doctors group where they were three (100%).

Previous training on weight management (p = .532), showed no significant differences among professionals surveyed. A large majority of nurses 55 (84.6%) and doctors 30 (79%) had no previous training on how to manage excess weight coming into the survey. Among the nurses, only 10 (15.4%) had had previous training on weight management. None of the psychologists or occupational therapists had had such training. About 8 (21.1%), 6 (24%) and 1 (7.7%) of doctors, support workers and social workers respectively had had previous training on weight management prior to filling out the study questionnaire.

Table 11

The Association Between Gender, Race and Previous Training Characteristics With Professional Groups

	Nurse	Psychologist	Occupational Therapist	Doctor	Support worker	Social Worker	Pearson's Chi^2
Gender							
Male	33 (48.5)	0(0)	1(14.3)	30(77)	8(34.8)	4(31)	.000
Female	35(51.5)	4(100)	6(85.7)	9(23)	15(65.2)	9(69.2)	
Race:							
Asian	0(0)	0(0)	1(14.3)	18(60)	4(16.7)	2(15.4)	.000
Black	10(17.2)	0(0)	1(14.3)	1(3.3)	4(16.7)	4(30.8)	
White	47(81.0)	2(100)	5(71.4)	7(23.3)	15(66.7)	7(53.9)	
Mixed Race	1(1.7)	0(0)	0(0)	1(3.3)	0(0)	0(0)	
Other	0(0)	0(0)	0(0)	3(10)	0(0)	0(0)	
Previous Training:							
No	55(84.6)	3(100)	6(100)	30(79)	19(76)	12(92.3)	.532
Yes	10(15.4)	0(0)	0(0)	8(21.0)	6(24)	1(7.7)	

Research Questions and Hypotheses

Preliminary univariate tests were carried out to describe the study participants based on their WMAB scores and the demographics namely, gender, previous training on weight management, profession, specialty, race, age, years of practice and BMI. Details are contained in Table 12. There were significant differences in WMAB scores between the genders of the participants (p = .050), though this could be viewed as being marginally significant given the p value. Professional groups had significantly different mean WMAB score (p = .000).

Specific pairwise differences were also identified based on the Tukey post hoc test. The WMAB mean scores of nurses (10.93, p = .000), social workers (10.77, p =

.015) and doctors (11.25, p = .000) were significantly higher than the support workers mean scores on the WMAB subscale.

Table 12

WMAB Means by Gender, Previous Training in Weight Management, Profession, and Specialty With ANOVA

	WMAB Mean (*SD*)	*p* value
Gender:		
Male	10.83(3.49)	.050*
Female	9.70(3.69)	
Previous training on weight management:		
No	9.98(3.58)	.077
Yes	11.38(4.02)	
Profession:		
Nurse	10.93(3.22)[a]	0.00*
Psychologist	9.00(2.45)	
Occupational Therapist	10.00(3.70)	
Doctor	11.24(3.00)[a]	
Support Worker	6.96(4.33)	
Social Worker	10.77(3.24)[a]	
Specialty:		
Child & Adolescent	10.00(0)	.282
Old Age	8.60(4.77)	
General Adult	10.52(3.58)	
Race:		
Asian	11.92(3.05)	.071
Black	10.67(3.77)	
White	9.51(3.71)	
Mixed Race	9.50(9.19)	
Other	10.67(3.05)	
	R	*p* value
Age (Mean = 40.30)	. 059	.233
Years of practice (Mean = 12.92)	.068	.200
BMI (Mean = 25.96)	.130	.063

* = statistically significant

a = significantly different from support worker ($p<.05$)

According to the Table 13 the ANOVA indicated significant differences between the professional groups (p = .006) with regards to knowledge (p = .006). Only gender (p = .012), and race (p = .027) showed differences in the means scores of situational perception scores of their groups. The Tukey post hoc test result, the Asian professionals scored better than their white counterparts on the situational perception subscale (8.72, p = .048).

With regards to self-efficacy scores, gender (p = .005) profession (p = .019) and specialty (p = .034), showed significant differences between their groups. Based on the Tukey post hoc test, among the professional groups, nurses' (15.15, p = .020) and doctors (15.35, p = .031) scores on self-efficacy were higher than those of the support workers. Both findings were statistically significant. Tukey post hoc test was not possible for specialty as one its groups had fewer than two cases.

There were significant differences in the professional groups (p = .035), and between the races (p = .001) with regards to the expectations scores. Tukey post hoc test suggests significant differences in the mean scores of doctors (52.05, p = .026) compared to support workers. There was also differences between the race with Asian having higher scores on expectations (52.68, p = .024) than white professionals. On the other hand, white professionals scored higher than professionals who reported their race as 'others' (43.80, p = .045).

Four demographic variables, race (p = .012), profession (p = .013), previous training on weight management (p = .029) and gender (p = .002), all showed differences in their groups with regards to scores on goal setting. Among the professionals, Asians

mean score on goal setting was higher (24.68, $p = .006$) compared to the white professionals. Nurses (21.34, $p = .037$) and doctors (23.25, $p = .004$) mean scores were significantly higher than those of support workers.

Based on the preliminary univariate analysis in Table 12, WMAB is independently associated with gender and profession. Among the independent variables, gender had independent associations with situational perception, self-efficacy and goal setting. On the other hand, profession was independently associated with knowledge, expectations, self-efficacy and goal setting. It could be argued that gender and profession are potential confounding variable between WMAB and the independent variables (SCT constructs).

Table 13

SCT Construct Scores

	Knowledge	Expectations	Situational Perception	Self-Efficacy	Goal Setting
	Mean (*sd*)	Mean (*s*d)	Mean (*sd*)	Mean (*sd*)	Mean (*s*d)
Gender:	*p* = .147	*p* = .349	*p* = .012*	*p* = .005*	*p* = .002*
Male	8.97(1.86)	48.45(14.38)	7.69(2.88)	15.56(5.93)	22.46(7.39)
Female	8.46(2.38)	46.36(13.54)	6.53(2.82)	12.86(5.87)	18.61(7.95)
Previous training on weight management	.284	.949	.780	.241	.029*
No	8.65(2.27)	47.58(14.65)	7.13(3.04)	13.90(6.17)	19.87(8.26)
Yes	9.15(1.52)	47.38(12.00)	7.31(2.91)	15.42(5.18)	23.65(6.22)
Profession:	.006*	.035*	.685	.019*	.013*
Nurse	9.07(1.89)	49.15(13.72)	7.39(3.21)	15.15(5.36)[a]	21.35(7.55)[a]
Psychologist	9.25(0.96)	49.25(17.80)	5.50(1.73)	14.75(4.03)	19.75(7.50)
Occupational Therapist	9.14(1.07)	43.71(19.42)	6.29(3.86)	15.71(7.34)	18.86(8.34)
Doctor	9.20(1.74)	52.05(13.64)[a]	7.55(2.64)	15.35(5.77)[a]	23.35(6.23)[a]
Support Worker	7.36(2.43)	41.24(13.22)	6.84(3.27)	10.80(6.61)	16.00(8.71)
Social Worker	8.53(2.47)	43.61(14.10)	7.31(1.80)	12.15(6.66)	19.70(9.92)
Specialty	.862	.852	.411	.034*	.070
Child & Adolescent	9.00(0.00)	43.00(0.00)	8.00(0.00)	14.00(0.00)	11.00(0.00)
Old Age	8.40(1.71)	49.50(8.67)	6.00(3.30)	9.40(6.47)	15.50(8.61)
General Adult	8.77(2.17)	47.38(14.25)	7.30(3.00)	14.65(6.05)	20.87(8.07)
Race	.820	.001*	.027*	.234	.012*
Asian	9.04(1.49)	52.68(11.65)[b]	8.72(2.49)[b]	16.88(5.28)	24.68(4.61)[b]
Black	8.67(1.28)	52.24(11.26)	7.29(3.69)	12.90(7.57)	20.14(8.88)
White	8.61(2.53)	43.81(13.04)[c]	6.83(2.92)	14.05(5.81)	18.45(7.97)
Mixed Race	8.00(2.83)	40.00(28.28)	10.50(3.54)	12.50(16.26)	19.50(17.68)
Other	9.67(0.58)	65.00(19.47)	5.33(2.31)	14.00(9.00)	25.00(12.12)
Age	.245	.488	.167	.468	.137
(Mean = 40.3)	*r* = -0.056	r = 0.002	*r* = 0.079	*r* = 0.007	*r* = 0.089
Years of practice	.335	.165	.406	.477	.140
(Mean = 12.92)	*r* = -0.034	*r* = -0.078	*r* = -0.019	*r* = -0.005	*r* = -0.087
BMI	.134	.440	.257	.051	.394
(Mean = 25.9)	*r* = -0.94	*r* = -0.013	*r* = 0.055	*r* = 0.138	r = 0.023

r = Pearson's correlation
SD = Standard deviation
* = statistically significant
a = significantly different from support workers ($p<.05$)
b = significantly different from white ($p<.05$)
c = significantly different from 'other' ($p<.05$)

Research Question 1

To what extent does the knowledge of weight management behavior influence WMAB among mental health professionals?

H_0: knowledge has no statistically significant association with WMAB among mental health professionals

H_1: knowledge has a statistically significant association with WMAB among mental health professionals

Knowledge explained 8.2% of the total variation in WMAB according to simple linear regression analysis result in Table 14 below. Knowledge and WMAB are weakly correlated, $r = .29$, $p<0.001$. Knowledge has a significant association with WMAB ($p<.001$) and with each increase in knowledge score, the WMAB score increases by about 3. Given the statistical significance of the above association, the null hypothesis that suggests there is no association between knowledge and weight management advice can be rejected.

Research Question 2

To what extent does the work environment (situational perception) influence WMAB among mental health professionals?

H_0: Health professionals' work environment (situational perception) has no statistically significant association with WMAB among mental health professionals

H_1: Health professionals' work environment (situational perception) has a statistically significant association on WMAB among mental health professionals

Situational perception explains 27.8% of the variance of weight management advice behaviour. There is a moderate correlation between Situational perception and WMAB, $r = .531$, $p<0.001$. Situational perception showed a significant association with WMAB ($p<.0001$) in the simple regression analysis as is indicated in Table 13. With each unit increase in situational perception, the WMAB score is increased by approximately 8. The above reported findings are significant and as such of the null hypothesis that there is no association between situational perception and WMAB was rejected.

Research Question 3

To what extent does self-efficacy in offering advice on weight management behavior influence WMAB among mental health professionals?

H_0: Self-efficacy has no statistically significant association with WMAB among mental health professionals

H_1: Self-efficacy has a statistically significant association with weight management

The SCT construct, self-efficacy explained 53.9% of the weight management behavior variance according to Table 12 and it showed self-efficacy has a strong correlation with WMAB, $r = .736$, $p<0.001$. Self-efficacy was significant ($p<.0001$), and results in Table 12 following the simple linear regression suggests that with each unit increment in self-efficacy score, the WMAB score increased by 0.74. given the association between self-efficacy and WMAB was significant, the null hypothesis, there is no association between self-efficacy and WMAB is rejected.

Research Question 4

To what extent do expectations (outcome expectancies and outcome expectations) influence WMAB among mental health professionals?

H_0: Healthcare professionals' expectations have no statistically significant association with WMAB among mental health professionals

H_1: Healthcare professionals' expectations have a statistically significant association with WMAB among mental health professionals

Expectations explained 17% of the WMAB variance and has a moderate correlation with WMAB, $r = .42$, $p<0.001$. There was a significant ($p<.0001$) association between expectations and WMAB. According to the results from simple linear regression testing the association between expectations and WMAB, the WMAB score increases by 0.42 with each unit increase in expectation score. The significance of this finding justified the rejection of the null hypothesis which no association between expectations and WMAB.

Research Question 5

To what extent does goal-setting abilities of mental health professionals influence their WMAB?

H_0: The ability of healthcare professionals to set goals has no statistically significant association with WMAB among mental health professionals

H_1: The ability of healthcare professionals' to set goals has a statistically significant association with WMAB among mental health professionals

Goal setting explains 46.2% of the total variation in WMAB as is shown in Table 7. There is a strong correlation between Goal setting and WMAB, $r = .68$, $p<0.001$. As is indicated in Table 13, goal setting is statistically associated with WMAB ($p<.0001$) with each unit increase in goal setting score, increasing the WMAB score increases by 0.68. The null hypothesis, there is no association between goal setting and WMAB is rejected because of the significance of the association between both variables.

Based on the results from the simple linear regressions in Table 12, it is evident that self-efficacy accounts for more of the variance in the WMAB scores of all the SCT constructs tested with knowledge accounting for the least variance in WMAB. The above reflects on their relationship with WMAB as each unit increase in self-efficacy score has the largest increase on WMAB scores with knowledge accounting for the least increase in WMAB. All the SCT constructs' associations with WMAB were significant with similar alpha levels. The ranges of the confidence interval are not wide suggesting the sample size is adequate. Particularly, goal setting, expectations, self-efficacy and situational perception have narrower confidence interval range in comparison to knowledge.

Table 14

Relationship Between SCT Constructs and WMAB

	Adjusted R^2	*B*	Beta	*p*	95% CI
Knowledge	.082	.507	.296	.0001	.254-.761
Situational perception	.278	.646	.531	.0001	.486-.805
Self-Efficacy	.539	.443	.736	.0001	.380-.506
Expectations	.170	.108	.418	.0001	.071-.506
Goal setting	.462	.312	.682	.0001	.260-.364

Separate regression models were created to include potential confounding variables for each independent variable, namely knowledge, situational perception, expectations, self-efficacy, and goal setting. The associations between the independent variables remained significant (p<.001) with marginal differences with respect to the B coefficients, Beta and confidence interval as could be seen in Table 15 below.

Table 15

Relationship Between SCT Constructs and WMAB After Adjusting for Confounding Variables

	Adjusted R^2	*B*	Beta	*p*	95% CI
Knowledge[a]	.113	.548	.307	.0001	.281-.814
Situational perception[b]	.282	.658	.658	.0001	.487-.829
Self-Efficacy[c]	.529	.441	.729	.0001	.372-.510
Expectations[a]	.201	.111	.425	.0001	.074-.148
Goal setting[c]	.457	.308	.669	.0001	.252-.365

a = profession included in the model
b = gender included in the model
c = gender and profession included in the model

Stepwise multiple linear regression analysis was conducted to assess the ability of expectations, knowledge, situational perception, self-efficacy, goal setting, gender, and profession to predict WMAB. Gender and profession were included in the model as both had the dependent variable and most of the independent variables have shown association with both. Self-efficacy, knowledge, goal setting and situational perception accounted for 65.1% of the variation in WMAB as shown in Table 15. The fourth and final step of the model from the analysis shown in Table 16 indicated that expectations was not a significant predictor to the model. Expectations was excluded automatically by SPSS

because it was weakest correlated variable as is the case in stepwise multiple regression analysis. Statistically significant predictors of WMAB were self-efficacy (p<.0001), knowledge (p<.0001), goal setting (p<.0001) and situational perception (p<.05). Given the above results, the null hypotheses suggesting no differences between Self-efficacy, knowledge, goal setting and situational perception individually and WMAB is rejected.

Table 16

Predictors of WMAB and Their Variations With Regards to WMAB

Model	*R*	*R* square	Adjusted *R* Square	Standard Error of the Estimate	*P*
1. Predictors: (Constant), SE	.733	.538	.535	2.48644	.000
2. Predictors (Constant), SE, Goal	.790	.624	.619	2.25024	.000
3. Predictors: (Constant), SE, Goal, Know	.805	.649	.642	2.18223	.001
4. Predictors: (Constant). SE, Goal, Know, SitP	.813	.660	.651	2.15306	.025

Prior to performing logistic regress with the view to predict the advice behavior of healthcare professional in the last 7 days, preliminary univariate analysis was carried out to establish the relationship between the weight management advise behavior in the last 7 days and gender, previous training on weight management, profession, specialty, race, age, years of experience and BMI. Chi squared test was used for the categorical variables while biserial correlation was used to test the relationship with continuous variables (age, years of experience and BMI). Only gender was significant (p<.05) as shown in Table 16. Only situational perception, self-efficacy and goal setting have independent associations with gender as shown in Table 15 above. Given these independent variables

are in majority as well as the fact that weight management advice in the last 7 days has independent association with gender, gender was assumed a potential confounding factor.

Table 17

Predictors of WMAB After Adjusting for Gender and Profession

	B	Beta	*T*	*p*	95%CI
Self-Efficacy	.264	.437	6.594	.0001	.185 - .344
Goal Setting	.140	.305	4.877	.0001	.084 - .197
Knowledge	.322	.183	3.652	.0001	.148 - .495
Situational Perception	.172	.137	2.257	.025	.021 - .322

Table 18

Demographic Description of Participant Weight Management Advising Behavior in the Last 7 Days

	No Advising	Yes Advising	*p* value
	N (%)	*N*(%)	
Gender:			
Male	29(38.16)	47(61.84)	.028*
Female	43(55.84)	34 (44.15)	
Previous training on weight management			
No	63(51.21)	60(48.78)	.124
Yes	9(12.5)	17(22.07)	
Profession			
Nurse	31(44.93)	38(55.07)	.771
Psychologist	2(50)	2(50)	
Occupational Therapist	4(57.14)	3(42.86)	
Doctor	15(37.5)	25(62.5)	
Support Worker	13(54.17)	11(45.83)	
Social Worker	7(53.85)	6(46.15	
Specialty:			
Child & Adolescent	1(100)	0(0)	.517
Old Age	5(55.56)	4(44.44)	
General Adult	59(47.2)	66(52.8)	
Race:			
Asian	8(32)	17(68)	.072
Black	8(42.11)	11(57.89)	
White	42(51.22)	40(48.78)	
Mixed	2(3.17)0(0)		
Other	3(4.76)0(0)		
Age	*r* = .075		.364
Years of Experience	*r* = -0.007		.933
BMI	*r* = .113		.186

- = statistically significant

r = biserial correlation

p value = *p* value related to chi^2

Simple binary logistic regression was done with each of the SCT constructs as independent variable and the advising on weight management in the last 7 days as the dependent variable. All the variables except knowledge were significant ($p<.05$), as is demonstrated in Table 19. With the inclusion of the potential confounding variable (gender) in the individual models, there were significant changes in the *p* values of knowledge and expectations but the confidence intervals remained largely unchanged as is highlighted in Table 20. Knowledge continued to remain insignificant with expectations' significance level being marginal ($p = 0.05$). Gender was included in the five individual models to test its confounding effects in the association between the independent variables and advising on weight management in the last 7 days.

Table 19

Relationship Between Individual SCT Constructs and Advising on Weight Management in the Last 7 Days

	B	SE	Wald	Odds Ratio	p	95%CI
Knowledge	.071	.075	.875	1.07	.350	.926-1.244
Expectation	.029	.012	5.667	1.03	.017	1.005-1.054
Situational Perception	.180	.062	8.498	1.20	.004	1.061-1.350
Self-Efficacy	.161	.035	21.522	1.18	.000	1.098-1.258
Goal Setting	.099	.024	16.784	1.10	.000	1.053-1.151

Table 20

Relationship Between Individual SCT Constructs and Advising on Weight Management in the Last 7 Days after adjusting for gender

	B	SE	Wald	Odds Ratio	p	95%CI
Knowledge	.036	.077	.217	1.04	.641	.892-1.205
Expectation	.024	.012	3.832	1.03	.050	1.000-1.050
Situational Perception	.157	.066	5.694	1.17	.017	1.028-1.331
Self-Efficacy	.161	.036	18.963	1.17	.000	1.090-1.256
Goal Setting	.097	.025	14.485	1.10	.000	1.048-1.158

Logistic regression analysis was conducted to investigate the relationship between knowledge, expectations, situational perception, self efficacy and goal setting with report of health care professionals having advised to have advised their patients on weight management in the last 7 days. The full model containing knowledge, expectations, situational perception, self efficacy and goal setting was significant (p<.001). The model as a whole explained between 19.2% (Cox and Snell R square) and 25.6% (Nagelkerke R squared) of the variance of WMAB and correctly predicts 52.9% of WMAB of health professionals 7 days prior to the survey.

The results of the logistic regression contained in Table 21, shows only self-efficacy made a significant contribution to the model with an odd ratio of 1.14 for every unit increase in the self-efficacy score.

Table 21

Logistic Regression Analysis of Advising on Weight Management in the Last 7 Days by the Predictors

	B	SE	Wald	Odds Ratio	*p*	95%CI
Gender	.037	.372	.977	1.44	.323	.697-2.993
Knowledge	-.046	.096	.236	.96	.627	.792-1.151
Expectation	-.004	.015	.058	.97	.810	.967-1.027
Situational Perception	-.040	.086	.222	96.0	.638	.812-1.136
Self-Efficacy	.134	.044	9.146	1.14	.002	1.048-1.248
Goal Setting	.061	.032	3.782	1.06	.052	1.000-1.131

Research Question 6

Is there any statistically significance difference among the professional groups with regards to knowledge, self-efficacy, goal setting, situational perception and expectations scores?

H_0: There is no statistically significant difference in Knowledge, Self-efficacy, Goal setting, Situational perception and Expectations scores based on the professionals group

H_1: There is a statistically significant difference in Knowledge, Self-efficacy, Goal setting, Situational perception and Expectations scores based on the professionals group.

A one way between-groups MANOVA was carried out to investigate professional differences in WMAB. The five dependent variables were knowledge, expectations, situational perception, self-efficacy, and goal setting. All the assumptions for MANOVA were met except the Levene's test of equality of error variance, which was violated given equal variance between the professional groups with respect to the independent variables, cannot be assumed with knowledge having *p* value $p<.05$. As a result of the latter, a conservative alpha level of 0.01 was set for the analysis instead of the conventional 0.05.

There was significant difference among the professional groups on the combined dependent variables, F (25, 562.44) = 1.667, p = .000; Wilks' Lambda = .052; partial eta squared = .023. On further consideration of the dependent variables individually, the only differences to reach statistical significance were the following; knowledge (p = .006), partial eta squared = .099, Expectations (p = .035), partial eta squared = .074, self-efficacy (p = .019), partial eta squared = .083, and goal setting (p = .013), partial eta squared = .088 as evident in Table 22. The partial eta refers to the variance of the dependent variable (SCT constructs) accountable by the independent variable (profession).

Table 22

Results From MANOVA Tests Highlighting Differences in SCT Construct Scores Among the Professional Groups

	Mean Square	*F*	*p*	Partial Eta Squared (R^2)
Knowledge	65.989	3.423	.006	.099
Expectation	2278.741	2.463	.035	.074
Situational Perception	27.984	.620	.685	.020
Self-Efficacy	477.399	2.796	.019	.083
Goal Setting	883.084	2.992	.013	.088

A close inspection of the mean and standard deviations as could be seen in Table 21, shows differences in the six professional groups.

Table 23

Means and Deviations of the Dependent Variable for the Different Professional Groups

	Nurse	Psychologist	Occupational Therapist	Doctor	Support Worker	Social Worker
	(*n*=72) (*M/SD*)	(*n*=4) (*M/SD*)	(*n*=7) (*M/SD*)	(*n*=40) (*M/SD*)	(*n*=24) (*M/SD*)	(*n*=13) (*M/SD*)
Knowledge	9.07(1.89)	9.25(0.89)	9.14(1.01)	9.20(1.73)	7.36(2.39)	8.54(2.39)
Expectations	49.15(13.72)	49.25(16.48)	43.71(8.95)	52.05(13.50)	41.24(13.00)	43.62(13.63)
Situational Perception	7.39(3.21)	5.50(1.60)	6.29(3.66)	7.55(2.61)	6.84(3.22)	7.30(1.74)
Self-Efficacy	15.15(5.35)	14.75(3.73)	15.71(6.97)	15.35(5.72)	10.80(6.51)	12.15(6.44)
Goal Setting	21.35(7.55)	19.75(6.94)	18.86(7.91)	23.25(6.17)	16.00(8.57)	19.69(9.59)

Summary

This chapter provided results on descriptive statistics and details from the inferential analysis as it relates to the research questions and hypotheses addressed in the current study. The descriptive analysis revealed there were more female in the study than men. Majority of the participants have not had any training on weight management and nurses were more in number among the participants and the least of the six professional groups being the psychologist. There was a relatively similar representation of Asian and Black professionals; but, the White professionals were overwhelmingly more in number among the participants.

The independent variables individually had no associations with age, years of practice, and BMI. Knowledge was associated with profession only but expectations had associations with both profession and race. Situational perception was significantly associated with gender and race. Both self-efficacy and goal setting had associations with

gender and profession. Self-efficacy was associated with specialty and goal setting associated with race.

Simple linear regression was used in testing the association between the independent variables knowledge, goal setting, self-efficacy, situational perception, and expectations and the dependent variable WMAB individually. All the independent variable showed statistically significant association with WMAB. Further multiple linear regression with variables entered using stepwise method, showed that self-efficacy ($p<.0001$), goal setting ($p<.0001$), knowledge ($p<.0001$), and situational perception ($p<.05$), are independent predictors of WMAB among mental health professionals.

Sself-efficacy ($p < .05$) was the only significant predictor following a logistic regression analysis done to predict probability of healthcare professionals to have advised their patients on weight management in the last 7 days. The estimated odds ratio self-efficacy indicated a positive relationship with the probability of advising patients on weight management behavior in the preceding seven days for every one-unit increase of their self-efficacy score.

Finally, a one way MANOVA carried out to test any differences among the different healthcare professional groups with regards to their WMAB suggested a statistically significant difference among the groups, $p = .000$; partial eta squared = .023. Knowledge ($p = .006$, partial eta squared = .099), Expectations, ($p = .035$, partial eta squared = .074), self-efficacy, ($p = .019$, partial eta squared = .083), and goal setting, ($p = .013$, partial eta squared = .088) reached statistical significance suggesting there are

differences among the various professional groups with regards to knowledge, expectation, self-efficacy and goal setting.

Profession and gender had moderating effect in the relationship between situational perception and WMAB in the multiple regression analysis result. The latter was demonstrated by the increased *p* value and reduction of the 95%CI. Adjusting for both profession and gender in the multiple regression analysis also erased the significant relationship between expectations and WMAB found in the simple linear regression. Gender had a moderating effect on the relationships between knowledge and expectation and the likelihood to advise on weight management in the last 7 days. The latter is evident from the increment in the p values compared to the p values before adjusting for gender. Gender also moderated the likelihood of advising on weight management in the last 7 days in the multiple logistic analysis, with only self-efficacy being significant. The latter is in comparison with the findings from the simple logistic regression where expectations, situational perception, self-efficacy and goal setting were all significant.

Chapter 5: Discussion, Conclusions, and Recommendations

In this cross-sectional study, I examined the ability of social cognitive theory constructs to predict WMAB of psychiatry professionals working in Dudley and Walsall Mental Health Partnership NHS Trust, UK. The focus was to determine the association between the constructs of interest and WMAB, if moderating variables such as age, gender, years of practice, BMI, previous training in weight management moderated the relationships between the SCT constructs and WMAB, variables that predict the probability of healthcare professionals to have advised their patients on weight management in the preceding seven days, and finally if there variation among healthcare professionals with regards to WMAB.

SCT, which explains behavior or actions as emanating from the interplay between three factors, behavior, personal factors and environment were used as the theoretical framework. I found that knowledge, expectation, self-efficacy, situational perception, and goal setting all have associations with WMAB. Self-efficacy, goal setting, knowledge, and situational perception were all independent predictors of WMAB among psychiatry professionals. People who reported higher self-efficacy scores were more likely to advise on weight management in the previous seven days, when gender, knowledge, expectation, situational perception, goal setting were controlled for. The six healthcare professional groups were found to differed with regards to their scores on the four of the five SCT constructs knowledge, expectations, self-efficacy and goal setting which potentially translates to differences in WMAB among the professional groups.

Interpretation of Findings

A higher proportion of the respondents were working in the adult psychiatry department when compared to the child and adolescent psychiatry and old age psychiatry departments. It is unclear why this disparity exists; but, it could be argued that WMAB might not be viewed a vital topic for professionals in departments such as child and adolescent psychiatry (CAMHS) and old age psychiatry.

Healthcare professionals are recommended to advise their obese patients on weight management (National Institute of Health guideline, 1998). The guideline was developed in response to the increasing prevalence of overweight and obesity as well as its associated complications. The role of healthcare professionals and their method of delivery of obesity management and prevention were highlighted as very vital for effective weight management (Kirk et al., 2012). WMAB skills are important across various professional specialties and should be investigated with the view to establish any differences. Identifying such differences is important because professionals, especially nurses and support workers are transferred between departments regularly and as such should have the skills for WMAB. The skills to advice on weight management might be viewed to be more suited in the general adult psychiatry population; but, it could be argued to be indispensable in the Old age psychiatry group as the patient population is most likely to have physical health problems which impact on their weight in addition to their mental health concerns. In the CAMHS population, these skills have the potentials to reduce difficulties associated with excessive weight gain or obesity such as bullying, psychological, and physical health problems too just like in the general population.

No study to my knowledge has investigated possible differences in WMAB among genders among mental health professionals. The reasons for the differences in gender with regards to WMAB mean scores in this research study is unclear. Gender however have been identified as a positive predictor of weight management practices among professions studied to determine relationship between doctors and nurses' weight status and weight management practices (Zhu, Norman, & While, 2011a). In the light of this research finding, differences in body dissatisfaction might be a factor with a subsequent impact on WMAB. Body dissatisfaction was reported to be similar between the genders (Chongwatpol, 2015); but, females went on to express wanting to be thinner in size compared to males. In the latter study, gender and environment affected the choice of food, physical activities and other weight management practices. In a similar study by Tsai et al. (2015), men had a less accurate perception of weight, less dissatisfied with their weight and less likely to attempt losing weight. These findings by Xiao et al. (2015) are similar to findings by Kuan et al. (2011) that suggests females were more likely to be concerned about body weight and shape. The differences in weight perception between the genders led to health professionals adopting interactional approach with male patients and cautious approach with female in making referrals for exercise schemes aimed at losing weight (Queen, Parker, & Crone, 2016).

The differences in the professional groups with regards to WMAB could be expected given the nurses and doctors have extensive training spanning through their education years, which could affect their ability to recognize the need for managing excessive weight among their patients. It is also unclear if there is any effect as a result of

their level of education, responsibilities and frequency of contact with patients causing the differences identified. The doctors, nurses, and social workers ideally have more years of higher education compared to support workers. The doctors and nurses study more about fundamental weight-related problems in comparison to all the other professional groups studied.

The expectations scores of professionals, which showed significant associations with WMAB mean scores could be related to professionals' knowledge of problems associated with excessive weight. The link between knowledge, expectation and self-efficacy, which was highlighted by Kedler et.al. (2015), might be applicable in this case. The difference in mean scores of expectations among the professionals of five ethnic groups that participated in the study highlights possible cultural influences on their WMAB. The multicultural and socioeconomic nature of the patients' population served by the surveyed professionals could likely hinder professionals' expectations. It could be that professionals might feel patients might not be able to follow through recommendations or advice as a result of its financial implications e.g. registering in a gym, changing or modifying diet, etc. As there is no known study of this sort among mental health professionals, it is an area of possible future research.

The variation in self-efficacy mean scores with regards to genders, professions and specialties, could be argued to be as a result of a combination of factors already mentioned, that is, nature and extent of education, responsibilities and frequency of contact with patients. These differences could also be associated with lack of knowledge, which in its right impacts on other constructs of SCT (Sharma & Romas, 2012).

Anderson et al. (2013) suggested that poor knowledge of obesity leading to a lack of confidence, which could be translated, as poor self-efficacy might be the case in this scenario. In a different study on HIV peer, education knowledge was positively associated with self-efficacy (Mahat et al., 2013). Self–efficacy is thought to be essential for any change in action (Sharma & Romas, 2012; Wagner & Wilkinson).

Another important finding from this research is the variation in situational perception score among the different genders and race. No known literature was found on situational perception applicable to WMAB. Gender, previous training on weight management, profession and race all varied within their groups on their goal setting mean scores. Differences in goal setting were evident between Asians and white respondents and among professionals between nurses, doctors, and support workers. These findings do not explain the time frame of the goal setting. It is unclear if goal setting is associated with self-efficacy as there is a degree of confidence needed to set achievable goals. The impact of goal setting in WMAB is all the more necessary as Brown et al. (2012), have found it to be an essential element of lifestyle intervention geared towards preventing excessive weight gain among pregnant women.

Knowledge

There is a significant but weak positive correlation between knowledge and WMAB. This means the more knowledge of weight management gained by health care professionals, the more likely they will advise their patients effectively on weight management behaviors. There is no previous literature on WMAB of mental health professionals, but this finding is consistent with the conclusions in Anderson et al. (2013)

who showed that colorectal clinicians were not familiar with the guidelines for lifestyle advice as is applicable in their patient's population. The latter possibly led to poor skills among the clinicians in providing lifestyle advice to their patients, and impacted on their confidence.

In a similar study by Bleich et al. (2015a), nutrition professionals were identified as being the most qualified of all the non-physician professional group involved in the study to provide advice on weight management. The nonphysician groups included professionals from nursing, pharmacy, mental health and behavioural backgrounds as well as professionals from sports background. The finding from Bleich et al. was linked strongly to the quality of training the nutrition professionals received on weight management. It could be argued that the nutritional professionals spend their time and entire profession on helping people maintain healthy weight as eating behavior and as such should know more about weight management than the other professionals involved in the cross sectional study.

Similar argument could be made about the variations in the knowledge of professional where doctors and nurses demonstrated more knowledge of weight-related issues in comparison to the other professional groups. The extensive training of doctors and nurses has the potential of exposing them to the causes and consequences of weight-related problems as well as its management. Macleod et al. (2013) demonstrated that lack of knowledge on weight management is linked with lack of confidence in managing weight gain. The latter could be assumed for WMAB though the scales for the

measurement of knowledge in the studies are different as well as the professional groups studied. Knowledge was also found to be an independent predictor for WMAB.

Self-Efficacy for Advising on Weight Management

Self-efficacy was positively associated with WMAB. The finding suggests that the more professionals believe that they can successfully carry out weight management advice to their patients, the more likely they are to advise on weight management behaviors. Self-efficacy also proved to be an independent predictor of WMAB as well as a predictor for the probability of health care professionals giving advice on weight management to patients in the previous 7 days. The above findings reflect similar findings from the cross-sectional study by Zhu et al. (2013), who found self-efficacy as a predictor of weight management practices among nurses in their study investigating confidence with regards to managing obese patients. The cross sectional study aimed at investigating the knowledge, training and self-efficacy of nonphysicians by Bleich et al. (2015b), not only identified the association between knowledge and self-efficacy but also demonstrated variation in self-efficacy among the professional groups studied. The variation among the non-physician groups demonstrated in Bleich et al. was linked to the quality of training on weight management but the cause of the variation found in this research study is largely unknown. It could be argued as well that the differences in self-efficacy scores of professional identified in this study might be as a result of effects of policies/guidelines and job descriptions, which may deter some of the professionals groups from engaging in WMAB.

The high quality of training reported by the nutrition professionals in Bleich, et al. (2015b) is subjective and as such is a potential limitation that should be taken into consideration in interpreting the study. The latter highlights the need to objectively determine the self-efficacy of health professionals on advising on weight management e.g. the use of prospective study design. This discrepancy in the quality of training offered to different professional groups with regards to weight management could be resolved to enable effective advising by health professionals.

In a systematic review by Zhu et al. (2013) examining professionals weight management attitudes in relation to their weight status, self-efficacy in weight management practices was higher in health professionals with healthy weight compared to others who were either overweight or obese, which is similar to Bleich et al. (2012) finding. The normal weight professionals according to Zhu et al. demonstrated perception of fewer barriers to weight management, have positive outcome expectations and overall less negative attitude towards their obese patients. The latter could be useful in identifying other factors that might be associated with self-efficacy in relation to WMAB. Volkmann et al. (2014); however, confirmed the independent and positive prediction of outcome expectation by self–efficacy.

Self-efficacy is linked with knowledge (Anderson et al., 2013; Macleod et al., 2013). Starket et al. (2011) confirmed that improving healthcare professionals' knowledge about interventions geared towards obesity prevention improves their self-efficacy in preventing obesity. The finding about self-efficacy from this research study reflects Welsh et al.'s (2015) suggestion that with knowledge comes with improved

confidence and subsequently the ability to set goals with the view to achieving an action or behavior, which in this case is WMAB. It also has to be argued that factors such as lack of weight management programs and patients' motivation could be contributory to the lack of self-efficacy, (Shaikh, Nettiksimmons, & Romano, 2011). The attitudes of obese patients towards health behavioral modification as reported by Intarakamhang and Intarakamhang (2015) affect the self-efficacy of health providers with regards to health behavior modification. The self-perceived effectiveness of health providers in the primary setting is responsible for the variation observed in their ability to manage lifestyle risks (Laws et al., 2009).

Goal Setting About Advising on Weight Management

The SCT construct, goal setting was in this research strongly and positively associated with WMAB. The above suggests that the more professionals set goals regarding advising on weight management in their patient population, the more likely WMAB is developed. Goal setting was also found to be an independent predictor of WMAB. Golley et al. (2011) found strong and specific goal setting to be one of the features of effective interventions aimed at weight-nutrition and activity. Ries et al. (2014) suggested goal setting in combination with adequate health information does increase the likelihood of patients moving to the action/maintenance stage of improving their diet and physical activity. This concept of goal setting could be mirrored on the professionals especially given the findings from this research study.

Expectation About Advising on Weight Management

Expectation is moderately and positively correlated with WMAB among healthcare professionals in the study. The latter means that the more expectations they have about weight management in their patients, the more likelihood they would advise them on weight management behaviors. Expectation is thought to develop through experience or learning from other people (Sharma & Romas, 2012). It does predict self-efficacy (Bryd-Bredbenner et al., 2011), and has a positive relationship with self-efficacy (Lowenstein et al., 2013). The finding that expectation is correlated with WMAB is consistent with Anderson-Bill et al.'s (2013) suggestion that outcome expectation predicted a change in behavior among the population they studied, which were enrolling in an online intervention. It is also worth mentioning that Crawford and Glover (2012) did not think that outcome expectation had any impact on the population they studies with regards to weight loss, regain of weight or dropping out of weight loss intervention among the overweight and obese.

Situational Perception About Advising on Weight Management

There is a moderate correlation between situational perception and WMAB. It proved to be an independent predictor of WMAB. There are no previous studies on situational perceptions as it applies to WMAB; but, it has been found to impact on task orientation and innovation (Brown, Williams, & Lynch, 2013) which could be argued to be consistent with the situational perception's link with weight management as was found in this research study. One interesting thing to note is the suggestion by Gormley (2011) that situational perception varies based on hierarchy. McKenzie et al. (2011) and

Papastravrou et al. (2014) have also acknowledged the variation in situational perception but suggest this is as a result of the settings/locations.

Differences knowledge, self-efficacy, situational perception and goal setting scores were found among the healthcare professionals. These were evident based on the means and standard deviations. The Wilk's Lambda was statistically significant. The adjusted alpha level proved the differences observed from MANOVA were significant for knowledge, expectation, self-efficacy and goal setting. The differences observed among the professional groups is not surprising given the differences in their engagement with patients, interventions each professional group provide in the care of patients and backgrounds.

Limitations of the Study

Some of the limitations of the study are the lack randomization, which could impact on the external validity of the study given the likelihood of inadequate representativeness of the population (Frankfort-Nachmias & Nachmias, 2008; Levin, 2006). Though the study achieved the calculated required sample size, the response rate from the questionnaires sent via email was 0.4% as only three participants returned their questionnaire. The rest of the questionnaires returned were distributed as a hard copy in professional meetings, team meetings, and hospital wards following a brief presentation of the study. The total number of participants represents only a 21% of the sample surveyed, which introduces respondents' bias. The overrepresentation and underrepresentation of the different professional groups based on the total number employed by the trust is also a source of bias in the study. The underrepresentation of the

various professional groups could lead to Type 2 error as potential effects might not be detected. Both the respondents' bias and the underrepresentation of professional groups potentially will affect the generalizability of the findings to the wider population.

Recall bias is a possible limitation especially given questionnaire was used, thereby potentially affecting the internal validity of the study (Frankfort-Nachmias & Nachmias, 2008; Woodward, 2013). It has to be acknowledged that this is an attitudinal assessment and as a result questionnaire has to be used. The fact that a significant number of questionnaires were not fully completed would have a negative impact on the internal validity of the study (Frankfort-Nachmias & Nachmias, 2008). Social desirability bias is a potential limitation given it could be acceptable for participants to respond to questions asked in ways that could be viewed acceptable by others. It could also be argued that this might be responsible for the low respondents' rate by professionals especially those with less knowledge of weight-related problems who might not want their responses to reflect badly on them. Participants might not have been very honest with their weight, age and height, as these tend to be sensitive topics for people. The use of estimated weights and heights, might have been underreported or over reported by overweight and underweight professionals respectively, given the sensitivities around weight. The latter could affect the outcome of the research leading to false conclusions being drawn.

All the participants possibly did not have the privilege of both receiving the questionnaires via e-mail as well as having the hard copy, which was given out during presentations at the team meetings, professional meetings, wards and units. This is because some staff work shift pattern and the nights staff were not reached. The latter

potentially affected the number of responses received, subsequently impacting on the validity of the study. As a cross-sectional study, the findings of this study could be nongeneralizable to the wider population, which limits the validity of the study (Frankfort-Nachmias & Nachmias).

Given the number of participants who responded, subgroup analysis potentially will not have enough power and as such the findings cannot be applied to the wider population. It is also worth mentioning that there are newer theories such as the Multitheory Model (MTM), which has been proven to be robust as it uses constructs that have been validated with a broad range of population (Sharma, 2015). MTM suggests likelihood of embarking on a behavior in the future and as such could be a good for predicting WMAB. Also one of its three primary constructs, behavioral confidence highlights that source of confidence is not exclusively from self as other external sources such as religion are also important (Sharma, 2015). The latter could be viewed to be more appropriate consideration to be made when predicting self-efficacy and this is not factored into the operationalization of self-efficacy in SCT.

Recommendations for Further Studies

There is no doubt that obesity is a public health concern in the general population (WHO, 2015b), so also is excessive weight gain and obesity in persons with a diagnosis of mental illness, who have the propensity to put on with and possibly become obese (Chawastiak, et al., 2011). Ideally, quality of life (Guo et al., 2013) and life expectancy Chang et al., 2011; Wahlbeck et al., 2011) of persons with mental illness are reduced remarkably in comparison to the wider population even without taking into account the

effects of excessive weight gain or obesity. Additional effects of weight-related problem potentially make these outcomes worse for them.

The associations of knowledge, expectation, self-efficacy, situational perception and goal setting with WMAB as evident from the simple linear regression analysis are expected, as there have been suggestions from previous studies done in different fields of such links. One would have thought that the same will be replicable in the multiple regression rather only three SCT, self-efficacy, goal setting and situational perception were found to be independent predictors of WMAB apart from gender and years of practice. Further research is needed to clarify these findings possibly using a larger sample size, which will give more power to the study. It also has to be reiterated that the sample size for this study was calculated and deemed to be appropriate. Such study should be given more time so that data could be collected over a longer period and particularly taking into consideration staff working nights as their experience might differ. This way, the data collected will be more representative of the population of interest.

The influence of the various specialties of psychiatry on the conduct of WMAB is an important question for further consideration. The latter could prove to be important as health staff working in dementia unit might not have any need for advising their patients on weight management as is the case with general adult ward which in its right also differs from the child and adolescent psychiatry units and learning disability units. Bleich et al. (2012) suggested that healthcare professionals' weight influences their confidence in providing counseling on dietary modification and exercise. This will be a good area to

investigate among psychiatry professionals. The effects of interactions between the SCT constructs and its impact on WMAB could be studied with the view to ascertain which combination of constructs might be best to have to enable effective advising.

Implications for Social Change

Various governments and the WHO have implemented several initiatives to make the general population aware of the dangers of excessive weight gain and obesity (WHO, 2015b). However, there has been no high-profile campaign to date to address the issue among people with mental illness. With the findings of this study, it is expected that the study will add to the body of literature on weight management in persons with mental illness and form the basis for further research studies given the paucity of literature in this area. As a result of the latter, this study can bring about positive social change through improving the overall wellbeing of persons with mental illness.

The findings that the knowledge, self-efficacy, situational perception, goal setting and expectation have associations with weight management as well as the fact that years of practice, gender, situational perception, goal setting and self-efficacy can independently predict WMAB could be a useful tool for services to determine staffs training as it applies to advising patients on weight management. The fact that knowledge is essential means that it should be provided to every healthcare professional with the view to developing them further to be confident in carrying out this role. It has to be remembered that knowledge, as well as other SCT concepts studied, are somehow linked. The finding could be useful in policy development and implementation in weight management. Some of the participants in their questionnaires highlighted ‘I don't know'

beside questions on policies on weight management in their hospital and some were certain there were no policies on weight management.

Findings from this study have the potential to translate the mentally ill population to a healthier patient population. By arming patients with advice on physical and dietary modifications, they learn and retain it for the long-term use. Their application of the offered advice can lead to the shedding of weight and look healthy, which would reduce the disease burden associated with excessive weight or obesity. At the same time, patients' self-esteem will improve with associated reduced self-perceived and experienced stigma. The latter in turn potentially could give rise to more active social life, and inclusion in their communities, which could bring about some economic benefits with it e.g. obtain employment. The economic burden (direct and indirect cost) of overweight or obesity on the caregivers or families of patients will be ameliorated with resultant financial savings being made. The government will also benefit, as there will be a resultant reduction in hospital attendances for appointments for obesity-related problems. The latter will save resources and cost to the government with such funds possibly being redirected to other pressing needs.

Finally, based on the finding of differences among the various professional groups involved in patients' care, opportunities for improvement among mental health facilities have been identified. There is also an opportunity for mental health Trusts to offer standardized training to staff regardless of specialty. The latter will mean that every patient coming across a profession will have the opportunity to receive adequate advice on weight management at all times.

Conclusions

Excessive weight gain remains a problem among persons with mental illness with estimated prevalence of about 40-60% of patients with a diagnosis of schizophrenia classed as either overweight or obese (Mitchell et al., 2013), 20% - 50% and between 25% and 60%, depressed and bipolar affective disorder patients respectively (McElroy et al., 2004). Correll et al.,(2010) suggested almost 80% of patients with suffering from schizophrenia, bipolar affective disorder or depressive illness are overweight or classed as obese. About 32.6% of patients with a diagnosis of PTSD, in the US are obese (Pagoto et al., 2012). And among US Iraq and Afghanistan veterans, those suffering from PTSD and depression had the highest risk of weight gain (Maguen et al., 2013). These statistics highlights the severity of the problem, and there is the potential for it continuing to plague persons with mental illness. It was important to carry out this study as the patient population are vulnerable and will continue to suffer the impact of excessive weight gain if adequate weight management advice is not offered.

The findings of this study are consistent with findings in other areas that utilized SCT to predict changes in action or behavior. There were significant relationships between WMAB and the SCT constructs with self-efficacy, situational perception and goal setting being independent predictors of WMAB. The study also suggested a difference of knowledge, self-efficacy, situational perception, goal setting and expectation scores among the professional groups. These findings will draw the attention of both service providers and commissioners on the need to address weight management

through adequate and effective advising on weight management behaviors in persons with mental illness.

The study also tends to highlight the responsibilities of healthcare professionals to their patients who may not be able to make steps towards addressing weight-related issues alone. It has also identified areas of further research and has the potential to influence public health initiatives that will improve the overall health of persons with mental illness. It is important to note that well-being of relatives and caregivers of persons with mental illness will directly or indirectly be positively affected as part of the social change associated with this study.

References

Abdel-Fadeel, N. A. M., Seidman, L. J., McCarley, R. W., Mesholam-Gately, R., Wojcik, J., & Mahfouz, R. (2013). Duration of untreated psychosis and untreated illness and their effect on clinical presentation in first episode psychosis. *Egyptian Journal of Neurology, Psychiatry & Neurosurgery*, *50*(4) 369-375.

Abdiasis, Y., Ahmad, R., Benson, L., & Muhim, A. (2015). What is the association between obesity and the risk of suicide attempts and injuries in the Canadian and American female Population? Poster presented at the Faculty of Health Sciences, University of Ottawa, Canada.

Alegria, M., Canino, G., Ríos, R., Vera, M., Calderón, J., Rusch, D., & Ortega, A. N. (2002). Mental health care for Latinos: Inequalities in use of specialty mental health services among Latinos, African Americans, and non-Latino Whites. *Psychiatric Services*, *53*, 1547-1555.

Ambwani, S., Thomas, K. M., Hopwood, C. J., Moss, S. A., & Grilo, C. M. (2014). Obesity stigmatization as the status quo: Structural considerations and prevalence among young adults in the US. *Eating Behaviors*, *15*(3), 366-370.

Anderson, A. S., Caswell, S., Wells, M., & Steele, R. J. C. (2013). Obesity and lifestyle advice in colorectal cancer survivors – How well are clinicians prepared? *Colorectal Disease*, *15*(8), 949-957.

Anderson-Bill, E. S., Winett, R. A., & Wojcik, J. R. (2011). Social cognitive determinants of nutrition and physical activity among web-health users enrolling in an online intervention: The influence of social support, self-efficacy, outcome

expectations, and self-regulation. *Journal of Medical Internet Research*, *13*(1), e28. doi:10.2196/jmir.1551.

Annesi, J. J. (2011). Self-regulatory skills usage strengthens the relations of self-efficacy for improved eating, exercise, and weight in the severely obese: Toward an explanatory model. *Behavioral Medicine*, *37*(3), 71-76.

Annesi, J. J., & Gorjala, S. (2010). Changes in theory-based psychological factors predict weight loss in women with class III obesity initiating supported exercise. *Journal of Obesity*, *2010*. doi:10.1155/2010/171957

Annesi, J. J., Unruh, J. L., Marti, N. C., Gorjala, S., & Tennant, G. (2011). Effects of the coach approach intervention on adherence to exercise in obese women: Assessing mediation of social cognitive theory factors. *Research Quarterly for Exercise and Sport*, *82*(1), 99-108.

Annesi, J. J., & Whitaker, A. C. (2010). Psychological factors discriminating between successful and unsuccessful weight loss in a behavioral exercise and nutrition education treatment. *International Journal of Behavioral Medicine*, *17*(3), 168-175.

Appel, L. J., Clark, J. M., Yeh, H. C., Wang, N. Y., Coughlin, J. W., Daumit, G., ... Brancati, F. L. (2011). Comparative effectiveness of weight-loss interventions in clinical practice. *New England Journal of Medicine*, *365*(21), 1959-1968.

Arsenault, L. N., Xu, K., Taveras, E. M., & Hacker, K. A. (2014). Parents' obesity-related behavior and confidence to support behavioral change in their obese child: Data from the STAR study. *Academic Pediatrics*, *14*(5), 456-462.

Ashen, M. D., & Blumenthal, R. S. (2014). Cardiovascular complications of obesity. In *Integrative Weight Management* (pp. 201-214). Springer New York.

Attux, C., Martini, L. C., Araújo, C. M. D., Roma, A. M., Reis, A. F., & Bressan, R. A. (2011). The effectiveness of a non-pharmacological intervention for weight gain management in severe mental disorders: results from a national multicentric study. *Revista Brasileira de Psiquiatria*, *33*(2), 117-121.

Attux, C., Martini, L. C., Elkis, H., Tamai, S., Freirias, A., Camargo, M. D. G. M., ... & Bressan, R. A. (2013). A 6-month randomized controlled trial to test the efficacy of a lifestyle intervention for weight gain management in schizophrenia. *BMC Psychiatry*, *13*(1), 60.

Babbie, E. (2015). *The practice of social research*. Belmont, CA: Wadsworth.

Bagherniya, M., Sharma, M., Mostafavi, F., & Keshavarz, S. A. (2015). Application of social cognitive theory in predicting childhood obesity prevention behaviors in overweight and obese Iranian adolescents. *International Quarterly of Community Health Education*, *15*(35), 133-147.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*(2), 122.

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, *31*(2), 143-164.

Bandura, A. (2011). Social cognitive theory. *Handbook of social psychological theories*, 349-373.

Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited. *Journal of Management*, *38*(1), 9-44.

Baranowski, T., Perry, C. L., & Parcel, G. S. (2002). *How individuals, environments, and health behavior interact.* Health behavior and health education. San Francisco, CA: Jossey-Bass, 165-84.

Barlow, S. E., & Dietz, W. H. (2002). Management of child and adolescent obesity: Summary and recommendations based on reports from pediatricians, pediatric nurse practitioners, and registered dietitians. *Pediatrics*, *110*(Supplement 1), 236-238.

Batch, J. A., & Baur, L. A. (2005). Management and prevention of obesity and its complications in children and adolescents. *Medical Journal of Australia*, *182*(3), 130.

Bleich, S. N., Bandara, S, Bennett, W. L., Cooper, L. A., & Gudzune, K. A. (2015a). *American Journal of Preventive Medicine.* 48(4), 411-418. doi:10.1016/j.amepre.2014.11.002.

Bleich, S. N., Bandara, S, Bennett, W. L., Cooper, L. A., & Gudzune, K. A. (2015b). Enhancing the role of nutrition professionals in weight management: A cross-sectional survey. *Obesity, 23*(2), 454–460. doi:10.1002/oby.20945

Bleich, S. N., Bennett, W. L., Gudzune, K. A., & Cooper, L. A. (2012). Impact of physician BMI on obesity care and beliefs. *Obesity*, *20*(5), 999-1005.

Boev, C. (2012). The relationship between nurses' perception of work environment and patient satisfaction in adult critical care. *Journal of Nursing Scholarship*, *44*(4), 368-375.

Bonfioli, E., Berti, L., Goss, C., Muraro, F., & Burti, L. (2012). Health promotion lifestyle interventions for weight management in psychosis: A systematic review and meta-analysis of randomised controlled trials. *BMC Psychiatry*, *12*(1), 78.

Bonfrate, L., Wang, D. Q., Garruti, G., & Portincasa, P. (2014). Obesity and the risk and prognosis of gallstone disease and pancreatitis. *Best Practice & Research Clinical Gastroenterology*, *28*(4), 623-635.

Bradshaw, T., & Mairs, H. (2014). Obesity and serious mental ill health: A critical review of the literature. In *Healthcare. 2*(2), 166-182. doi:10.3390/healthcare2020166

Brandl, E. J., Tiwari, A. K., Lett, T. A., Shaikh, S. A., Lieberman, J. A., Meltzer, H. Y., ... Müller, D. J. (2013). Exploratory study on association of genetic variation in TBC1D1 with antipsychotic‐induced weight gain. *Human Psychopharmacology: Clinical and Experimental*, *28*(2), 183-187.

Branscum, P., & Sharma, M. (2011). Predictors of snack food consumption among upper elementary children using social cognitive theory. *Journal of Social, Behavioral, and Health Sciences*, *5*(1), 3.

Brawley, L., Rejeski, W. J., Gaukstern, J. E., & Ambrosius, W. T. (2012). Social cognitive changes following weight loss and physical activity interventions in obese, older adults in poor cardiovascular health. *Annals of Behavioral Medicine*, *44*(3), 353-364.

Brown, M. J., Sinclair, M., Liddle, D., Hill, A. J., Madden, E., & Stockdale, J. (2012). A systematic review investigating healthy lifestyle interventions incorporating goal setting strategies for preventing excess gestational weight gain. *PloS One*, *7*(7), e39503.

Brown, S., Kim, M., Mitchell, C., & Inskip, H. (2010). Twenty-five-year mortality of a community cohort with schizophrenia. *British Journal of Psychiatry*, *196*(2), 116-121.

Brown, T., Williams, B., & Lynch, M. (2013). Relationship between clinical fieldwork educator performance and health professional students' perceptions of their practice education learning environments. *Nursing & Health Sciences*, *15*(4), 510-517.

Bruins, J., Jörg, F., Bruggeman, R., Slooff, C., Corpeleijn, E., & Pijnenborg, M. (2014). The effects of lifestyle interventions on (long-term) weight management, cardiometabolic risk and depressive symptoms in people with psychotic disorders: a meta-analysis. *PloS one*, *9*(12), e112276.

Bryant, R. A., O'donnell, M. L., Creamer, M., McFarlane, A. C., Clark, C. R., & Silove, D. (2010). The psychiatric sequelae of traumatic injury. *American Journal of Psychiatry*, 167, 312-320

Buckner, J. D., Heimberg, R. G., Ecker, A. H., & Vinci, C. (2013). A biopsychosocial model of social anxiety and substance use. *Depression and Anxiety*, *30*(3), 276-284.

Bunch, J. C., Robinson, J. S., & Edwards, M. C. (2012). Measuring the relationship between agriculture teachers' self-efficacy, outcome expectation, interest, and their use of interactive whiteboards. *Journal of Agricultural Education*, *53*(1), 67-80.

Byrd-Bredbenner, C., Abbot, J. M., & Cussler, E. (2011). Relationship of social cognitive theory concepts to mothers' dietary intake and BMI. *Maternal & Child Nutrition*, *7*(3), 241-252.

Caemmerer, J., Correll, C. U., & Maayan, L. (2012). Acute and maintenance effects of non-pharmacologic interventions for antipsychotic associated weight gain and metabolic abnormalities: A meta-analytic comparison of randomized controlled trials. *Schizophrenia Research*, *140*(1), 159-168.

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Boston, MA: Houghton Miffin.

Cannon, M., Jones, P., Gilvarry, C., Rifkin, L., McKenzie, K., Foerster, A., … Murray, R. M. (2015). Premorbid social functioning in schizophrenia and bipolar disorder: similarities and differences. *American Journal of Psychiatry*. *154*(11), 1544-1550.

Centers for Disease Control and Prevention, (2013). Addressing Obesity disparities: Social Ecological Model. Retrieved from http://www.cdc.gov/obesity/health_equity/addressingtheissue.html

Chang, C. K., Hayes, R. D., Perera, G., Broadbent, M. T., Fernandes, A. C., Lee, W. E., ... Stewart, R. (2011). Life expectancy at birth for people with serious mental

illness and other major disorders from a secondary mental health care case register in London. *PloS one*, *6*(5), e19590.

Chang, T., Llanes, M., Gold, K. J., & Fetters, M. D. (2013). Perspectives about and approaches to weight gain in pregnancy: A qualitative study of physicians and nurse midwives. *BMC Pregnancy and Childbirth*, *13*(1), 47.

Choi, S. P. P., Cheung, K. I. N., & Pang, S. M. C. (2013). Attributes of nursing work environment as predictors of registered nurses' job satisfaction and intention to leave. *Journal of Nursing Management*, *21*(3), 429-439.

Chongwatpol, P. (2015). *The influence of body image perception on weight management practices, physical activity levels and food choice behaviors among Thai adolescents* (Doctoral dissertation, Oklahoma, State University).

Chowdhury, N. I., Tiwari, A. K., Souza, R. P., Zai, C. C., Shaikh, S. A., Chen, S., ... Müller, D. J. (2013). Genetic association study between antipsychotic-induced weight gain and the melanocortin-4 receptor gene. *Pharmacogenomics Journal*, *13*(3), 272-279.

Christensen, H., Batterham, P. J., Hickie, I. B., McGorry, P. D., Mitchell, P. B., & Kulkarni, J. (2011). Funding for mental health research: the gap remains. *Medical Journal of Australia*, *195*(11-12), 681-684.

Chwastiak, L. A., Rosenheck, R. A., & Kazis, L. E. (2011). Association of psychiatric illness and obesity, physical inactivity, and smoking among a national sample of veterans. *Psychosomatics*, *52*(3), 230-236.

Cohn, T., Grant, S., & Faulkner, G. E. (2010). Schizophrenia and obesity: Addressing obesogenic environments in mental health settings. *Schizophrenia Research*, *121*(1), 277-278.

Cook, J. A., & Mueser, K. T. (2013). The challenge of obesity. *Psychiatric Rehabilitation Journal*, *36*(3), 129-132.

Correll, C. U., Druss, B. G., Lombardo, I., O'Gorman, C., Harnett, J. P., Sanders, K. N., ... Cuffel, B. J. (2010). Findings of a US national cardiometabolic screening program among 10,084 psychiatric outpatients. *Psychiatric Services*, *61*(9), 892-898.

Crawford, R., & Glover, L. (2012). The impact of pre-treatment weight-loss expectations on weight loss, weight regain, and attrition in people who are overweight and obese: A systematic review of the literature. *British Journal of Health Psychology*, *17*(3), 609-630.

Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.

Daumit, G. L., Dickerson, F. B., Wang, N. Y., Dalcin, A., Jerome, G. J., Anderson, C. A., ... Appel, L. J. (2013). A behavioral weight-loss intervention in persons with serious mental illness. *New England Journal of Medicine*,*368*(17), 1594-1602.

de Groot, M. H., van Campen, J. P., Moek, M. A., Tulner, L. R., Beijnen, J. H., & Lamoth, C. J. (2013). The effects of fall-risk-increasing drugs on postural control: a literature review. *Drugs & Aging*, *30*(11), 901-920.

Denler, H., Wolters, C., & Benzon, M. (2013). Social cognitive theory. Retrieved from *Education.com*.

Dennis, E. A., Potter, K. L., Estabrooks, P. A., & Davy, B. M. (2012). Weight gain prevention for college freshmen: comparing two social cognitive theory-based interventions with and without explicit self-regulation training. *Journal of Obesity*, *2012*. doi:10.1155/2012/803769

Dent, R., Blackmore, A., Peterson, J., Habib, R., Kay, G. P., Gervais, A., ... Wells, G. (2012). Changes in body weight and psychotropic drugs: a systematic synthesis of the literature. *PloS one*, *7*(6), e36889.

Department of Health, (2013). Reducing obesity and improving diet. In Bradshaw, T., & Mairs, H. (2014). Obesity and serious mental ill health: A critical review of the literature. *Healthcare, 2*(2), 166-182.

Dewar, D. L., Lubans, D. R., Plotnikoff, R. C., & Morgan, P. J. (2012). Development and evaluation of social cognitive measures related to adolescent dietary behaviors. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(36), 1-10.

Douglas, F., Torrance, N., Teijlingen, E., Meloni, S., & Kerr, A. (2006). Primary care staff's views and experiences related to routinely advising patients about physical activity. A questionnaire survey. *BMC Public Health*,*6*(1), 1.

Edmed, S. L., & Sullivan, K. A. (2014). The influence of injury cause, contact-sport participation, and personal knowledge on expectation of outcome from mild

traumatic brain injury. *Journal of Clinical and Experimental Neuropsychology*, *36*(3), 221-235.

Eisenberg, D., Hunt, J., & Speer, N. (2012). Help seeking for mental health on college campuses: Review of evidence and next steps for research and practice. *Harvard Review of Psychiatry*, *20*(4), 222-232.

Fagiolini, A., Frank, E., Scott, J. A., Turkin, S., & Kupfer, D. J. (2005). Metabolic syndrome in bipolar disorder: findings from the Bipolar Disorder Center for Pennsylvanians. *Bipolar Disorders*, *7*(5), 424-430.

Finch, L. E., & Tomiyama, A. J. (2015). Comfort eating, psychological stress, and depressive symptoms in young adult women. *Appetite*, *95*, 239-244.

Flegal, K. M., Carroll, M. D., Kuczmarski, R. J., & Johnson, C. L. (1998). Overweight and obesity in the United States: prevalence and trends, 1960-1994. *International Journal of Obesity and Related Metabolic Disorders*, *22*(1), 39-47.

Flegal, K. M., Carroll, M. D., Kit, B. K., & Ogden, C. L. (2012). Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. *Journal of the American Medical Association*, *307*(5), 491-497.

Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *Journal of the American Medical Association*, *303*(3), 235-241.

Fore, A. M., & Sculli, G. L. (2013). A concept analysis of situational awareness in nursing. *Journal of Advanced Nursing*, *69*(12), 2613-2621.

Foussias, G., & Remington, G. (2010). Negative symptoms in schizophrenia: Avolition and Occam's razor. *Schizophrenia Bulletin*, *36*(2), 359-369.

Franfort-Nachmias, C., & Nachmias, D. (2008). *Research methods in the social sciences.* (7th ed.). New York: Worth.

Galuska, D. A., Will, J. C., Serdula, M. K., & Ford, E. S. (1999). Are health care professionals advising obese patients to lose weight?. *Journal of the American Medical Association*, *282*(16), 1576-1578.

Garland, A. F., Lau, A. S., Yeh, M., McCabe, K. M., Hough, R. L., & Landsverk, J. A. (2005). Racial and ethnic differences in utilization of mental health services among high-risk youths. *American Journal of Psychiatry, 162*(7), 1336-1343.

Gelder, M. G., Juan, J. L. I., & Nancy, A. (2004). *New Oxford textbook of psychiatry, Vol 1 & 2*. Oxford: Oxford University Press.

Gerards, S. M., Dagnelie, P. C., Jansen, M. W., De Vries, N. K., & Kremers, S. P. (2012). Barriers to successful recruitment of parents of overweight children for an obesity prevention intervention: A qualitative study among youth health care professionals. *BMC Family Practice*, *13*(1), 37.

Gili, M., Roca, M., Basu, S., McKee, M., & Stuckler, D. (2013). The mental health risks of economic crisis in Spain: Evidence from primary care centres, 2006 and 2010. *European Journal of Public Health*, *23*(1), 103-108.

Golley, R. K., Hendrie, G. A., Slater, A., & Corsini, N. (2011). Interventions that involve parents to improve children's weight-related nutrition intake and activity patterns

– what nutrition and activity targets and behaviour change techniques are associated with intervention effectiveness? *Obesity Reviews*, *12*(2), 114-130.

Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.). (2008). *Health behavior and health education: theory, research, and practice*. John Wiley & Sons.

Gormley, D. K. (2011). Are we on the same page? Staff nurse and manager perceptions of work environment, quality of care and anticipated nurse turnover. *Journal of Nursing Mmanagement*, *19*(1), 33-40.

Grover, S., Malhotra, N., Chakrabarti, S., Nebhinani, N., Avasthi, A., Subodh, B. N., & Malhotra, S. (2015). Metabolic syndrome in adolescents with severe mental disorders: Retrospective study from a psychiatry inpatient unit. *Asian Journal of Psychiatry*, 14, 69-70

Guo, X., Zhang, Z., Zhai, J., Wu, R., Liu, F., & Zhao, J. (2013). The relationship between obesity and health-related quality of life in Chinese patients with schizophrenia. *International Journal of Psychiatry in Clinical Practice*, *17*(1), 16-20.

Harriger, J. A., & Thompson, J. K. (2012). Psychological consequences of obesity: Weight bias and body image in overweight and obese youth. *International Review of Psychiatry*, *24*(3), 247-253.

Hasnain, M., & Vieweg, W. V. R. (2013). Weight considerations in psychotropic drug prescribing and switching. *Postgraduate Medicine*, *125*(5), 117-129.

Hatzenbuehler, M. L., Phelan, J. C., & Link, B. G. (2013). Stigma as a fundamental cause of population health inequalities. *American Journal of Public Health*, *103*(5), 813-821.

Health & Social Care Information Centre, (2009). Adult Psychiatric Morbidity in England - 2007, Results of a household survey [NS]. Retrieved from http://www.hscic.gov.uk/searchcatalogue?productid=151&topics=1%2fMental+health%2fMental+health+surveys&infotype=0%2fSurvey&sort=Relevance&size=10&page=1#top

Henderson, D. C., Cagliero, E., Gray, C., Nasrallah, R. A., Hayden, D. L., Schoenfeld, D. A., … Goff, D. C. (2014). Clozapine, diabetes mellitus, weight gain, and lipid abnormalities: A five-year naturalistic study. *American Journal of Psychiatry, 157*(6), 975-981

Henderson, C., Evans-Lacko, S., & Thornicroft, G. (2013). Mental illness stigma, help seeking, and public health programs. *American Journal of Public Health*, *103*(5), 777-780.

Heneghan, H. M., Heinberg, L., Windover, A., Rogula, T., & Schauer, P. R. (2012). Weighing the evidence for an association between obesity and suicide risk. *Surgery for Obesity and Related Diseases*, *8*(1), 98-107.

Hert, M., Cohen, D., Bobes, J., Cetkovich-Bakmas, M. A. R. C. E. L. O., Leucht, S., Ndetei, D. M., ... Gautam, S. (2011). Physical illness in patients with severe mental disorders. II. Barriers to care, monitoring and treatment guidelines, plus

recommendations at the system and individual level. *World Psychiatry*, *10*(2), 138-151.

Hollon, S. D., & Ponniah, K. (2010). A review of empirically supported psychological therapies for mood disorders in adults. *Depression and Anxiety*, *27*(10), 891-932.

Holt, R. I., & Peveler, R. C. (2009). Obesity, serious mental illness and antipsychotic drugs. *Diabetes, Obesity and Metabolism*, *11*(7), 665-679.

Holt, R. I. G., & Peveler, R. C. (2010). Diabetes and cardiovascular risk in severe mental illness: A missed opportunity and challenge for the future. *Practical Diabetes International*, *27*(2), 79-84ii.

Howes, O., McCutcheon, R., & Stone, J. (2015). Glutamate and dopamine in schizophrenia: An update for the 21st century. *Journal of Psychopharmacology*, *29*(2), 97-115.

Intarakamhang, U., & Intarakamhang, P. (2015). Multilevel Causal Analysis of Socio-Psychological and Behavioral Factors of Health Providers and Clients That Affect Health Behavioral Modification in Obesity. *Global Journal of Health Science*, *7*(6), 117.

Jackson, K. L., Janssen, I., Appelhans, B. M., Kazlauskaite, R., Karavolos, K., Dugan, S. A., ... Kravitz, H. M. (2014). Body image satisfaction and depression in midlife women: the Study of Women's Health Across the Nation (SWAN). *Archives of Women's Mental Health*, *17*(3), 177-187.

Jebb, S. A. (2014). Government action to tackle obesity. In *Controversies in Obesity* (pp. 17-22). Springer London.

Jensen, M. D., Ryan, D. H., Apovian, C. M., Ard, J. D., Comuzzie, A. G., Donato, K. A., ... Loria, C. M. (2014). 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: A report of the American college of cardiology/American heart association task force on practice guidelines and the obesity society. *Journal of the American College of Cardiology*, *63*(25_PA), 2985-3023.

Kaplan, D. (Ed.). (2004). *The Sage Handbook of Quantitative Methodology for Social Sciences.*Thousand Oaks, CA: Sage Publications.

Kakuma, R., Minas, H., van Ginneken, N., Dal Poz, M. R., Desiraju, K., Morris, J. E., ... Scheffler, R. M. (2011). Human resources for mental health care: current situation and strategies for action. *The Lancet*, *378*(9803), 1654-1663.

Kelder, S. H., Hoelscher, D., & Perry, C. L. (2015). How individuals, environments, and health behaviors interact. *Health behavior: Theory, research, and practice*, 159.

Kirk, S. F. L., Penney, T. L., McHugh, T. L., & Sharma, A. M. (2012). Effective weight management practice: a review of the lifestyle intervention evidence. *International journal of Obesity*, *36*(2), 178-185.

Klinitzke, G., Steinig, J., Blüher, M., Kersting, A., & Wagner, B. (2013). Obesity and suicide risk in adults—a systematic review. *Journal of Affective Disorders*, *145*(3), 277-284.

Kuan, P. X., Ho, H. L., Shuhaili, M. S., Siti, A. A., & Gudum, H. R. (2011). Gender differences in body mass index, body weight perception and weight loss strategies

among undergraduates in Universiti Malaysia Sarawak. *Malays Journal of Nutrition*, *17*(1), 67-75.

Lambrou, P., Merkouris, A., Middleton, N., & Papastavrou, E. (2014). Nurses' perceptions of their professional practice environment in relation to job satisfaction: A review of quantitative studies. *Hospitals*, *14*, 15.

Laws, R. A., Jayasinghe, U. W., Harris, M. F., Williams, A. M., Davies, G. P., & Kemp, L. A. (2009). Explaining the variation in the management of lifestyle risk factors in primary health care: a multilevel cross sectional study. *BMC Public Health*, *9*(1), 1.

Leonard, B. E., Schwarz, M., & Myint, A. M. (2012). The metabolic syndrome in schizophrenia: is inflammation a contributing cause? *Journal of Psychopharmacology*, *26*(5 suppl), 33-41.

Levin, K. A. (2006). Study design III: Cross-sectional studies. *Evidence-based dentistry*, *7*(1), 24-25.

Lin, H. Y., Huang, C. K., Tai, C. M., Lin, H. Y., Kao, Y. H., Tsai, C. C., ... Yen, Y. C. (2013). Psychiatric disorders of patients seeking obesity treatment. *BMC Psychiatry*, *13*(1), 1.

Lindenmayer, J. P., Czobor, P., Volavka, J., Citrome, L., Sheitman, B., McEvoy, J. P., ... Lieberman, J. A. (2014). Changes in glucose and cholesterol levels in patients with schizophrenia treated with typical or atypical antipsychotics. *American Journal of Psychiatry, 160*(2), 290-296

Link, B. G., Struening, E. L., Neese-Todd, S., Asmussen, S., & Phelan, J. C. (2014). Stigma as a barrier to recovery: The consequences of stigma for the self-esteem of people with mental illnesses. *Psychiatric Services*. Retrieved from http://www.heart-intl.net/HEART/120606/StigmaasaBarrier.htm

Liu, J. J., Davidson, E., Bhopal, R., White, M., Johnson, M., Netto, G., … Sheikh, A. (2015). Adapting health promotion interventions for ethnic minority groups: a qualitative study. *Health Promotion International*, *105.*

Looijmans, A., Jörg, F., Schoevers, R. A., Bruggeman, R., Stolk, R. P., & Corpeleijn, E. (2014). Changing the obesogenic environment of severe mentally ill residential patients: ELIPS, a cluster randomised study design. *BMC Psychiatry*, *14*(1), 293.

Lorenc, T., Clayton, S., Neary, D., Whitehead, M., Petticrew, M., Thomson, H., ... Renton, A. (2012). Crime, fear of crime, environment, and mental health and wellbeing: Mapping review of theories and causal pathways. *Health & Place*, *18*(4), 757-765.

Laursen, T. M. (2011). Life expectancy among persons with schizophrenia or bipolar affective disorder. *Schizophrenia Research*, *131*(1), 101-104.

Laursen, T. M., Munk-Olsen, T., & Vestergaard, M. (2012). Life expectancy and cardiovascular mortality in persons with schizophrenia. *Current Opinion in Psychiatry*, *25*(2), 83-88.

Luppino, F. S., de Wit, L. M., Bouvy, P. F., Stijnen, T., Cuijpers, P., Penninx, B. W., … Zitman, F. G. (2010). Overweight, obesity, and depression: a systematic review

and meta-analysis of longitudinal studies. *Archives of General Psychiatry*, *67*(3), 220-229.

Lowenstein, L. M., Perrin, E. M., Campbell, M. K., Tate, D. F., Cai, J., & Ammerman, A. S. (2013). Primary care providers' self-efficacy and outcome expectations for childhood obesity counselling. *Childhood Obesity*, *9*(3), 208-215.

Macleod, M., Gregor, A., Barnett, C., Magee, E., Thompson, J., & Anderson, A. S. (2013). Provision of weight management advice for obese women during pregnancy: a survey of current practice and midwives' views on future approaches. *Maternal & Child Nutrition*, *9*(4), 467-472.

Maguen, S., Madden, E., Cohen, B., Bertenthal, D., Neylan, T., Talbot, L., ... Seal, K. (2013). The relationship between body mass index and mental health among Iraq and Afghanistan veterans. *Journal of General Internal Medicine*, *28*(2), 563-570.

Mahat, G. A. N. G. A., Scoloveno, M. A., & Ayres, C. (2013). Comparison of adolescents' HIV/AIDS knowledge and self-efficacy across two cultures. *Journal of Cultural Diversity*, *21*(4), 152-158.

Maiman, L. A., Wang, V. L., Becker, M. H., Finlay, J., & Simonson, M. (1979). Attitudes toward obesity and the obese among professionals. *Journal of the American Dietetic Association*, *74*(3), 331-336.

Mazur, A., Matusik, P., Revert, K., Nyankovskyy, S., Socha, P., Binkowska-Bury, M., ... Malecka-Tendera, E. (2013). Childhood obesity: Knowledge, attitudes, and practices of European pediatric care providers. *Pediatrics*, *132*(1), e100-e108.

McCloughen, A., & Foster, K. (2011). Weight gain associated with taking psychotropic medication: An integrative review. *International Journal of Mental Health Nursing*, *20*(3), 202-222.

McElroy, S. L., Kotwal, R., Malhotra, S., Nelson, E. B., Keck, P. E., & Nemeroff, C. B. (2004). Are mood disorders and obesity related? A review for the mental health professional. *Journal of Clinical Psychiatry*, *65*(5), 634-651.

McGorry, P., Bates, T., & Birchwood, M. (2013). Designing youth mental health services for the 21st century: examples from Australia, Ireland and the UK. *British Journal of Psychiatry*, *202*(s54), s30-s35.

McKee, M. D., Maher, S., Deen, D., & Blank, A. E. (2010). Counselling to prevent obesity among preschool children: Acceptability of a pilot urban primary care intervention. *Annals of Family Medicine*, *8*(3), 249-255.

McKenzie, J. A. L., Blandford, A. A., Menec, V. H., Boltz, M., & Capezuti, E. (2011). Hospital nurses' perceptions of the geriatric care environment in one Canadian health care region. *Journal of Nursing Scholarship*, *43*(2), 181-187.

Megna, J. L., Schwartz, T. L., Siddiqui, U. A., & Herrera Rojas, M. (2011). Obesity in adults with serious and persistent mental illness: A review of postulated mechanisms and current interventions. *Annals of Clinical Psychiatry*, *23*(2), 131-140.

Meyer, U., Feldon, J., & Dammann, O. (2011). Schizophrenia and autism: both shared and disorder-specific pathogenesis via perinatal inflammation? *Pediatric Research*, *69*, 26R-33R.

Mills, A. J., Durepos, G., & Wiebe, E. (Eds.). (2009). *Encyclopedia of Case Study Research* (Vol. 2). Thousand Oaks, CA: Sage Publications.

Murnan, J., Sharma, M., & Lin, D. (2006). Predicting childhood obesity prevention behaviors using social cognitive theory: Children in China. *International Quarterly of Community Health Education*, *26*(1), 73-84.

National Obesity Observatory, (2010). The economic burden of obesity. Retrieved from http://www.noo.org.uk/uploads/doc/vid_8575_Burdenofobesity151110MG.pdf

National Institutes of Health. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report*. Bethesda, Md: National Institutes of Health, US Dept. of Health and Human Services; 1998.

Newcomer, J. W., Nasrallah, H. A., & Loebel, A. D. (2004). The atypical antipsychotic therapy and metabolic issues national survey: Practice patterns and knowledge of psychiatrists. *Journal of clinical psychopharmacology*, *24*(5), S1-S6.

Nielsen, R. E., Uggerby, A. S., Jensen, S. O. W., & McGrath, J. J. (2013). Increasing mortality gap for patients diagnosed with schizophrenia over the last three decades—a Danish nationwide study from 1980 to 2010. *Schizophrenia Research*, *146*(1), 22-27.

Nihalani, N., Schwartz, T. L., Siddiqui, U. A., & Megna, J. L. (2011). Weight gain, obesity, and psychotropic prescribing. *Journal of Obesity*, *2011*.

Nihalani, N., Schwartz, T. L., Siddiqui, U. A., & Megna, J. L. (2012). Obesity and psychotropics. *CNS Neuroscience & Therapeutics*, *18*(1), 57-63.

Nordentoft, M., Wahlbeck, K., Hallgren, J., Westman, J., Osby, U., Alinaghizadeh, H., ... Laursen, T. M. (2013). Excess mortality, causes of death and life expectancy in 270,770 patients with recent onset of mental disorders in Denmark, Finland and Sweden. *PloS one*, *8*(1), e55176.

Nguyen, N., Champion, J. K., Ponce, J., Quebbemann, B., Patterson, E., Pham, B., ... Favretti, F. (2012). A review of unmet needs in obesity management. *Obesity Surgery*, *22*(6), 956-966.

Nyberg, G., Sundblom, E., Norman, Å., & Elinder, L. S. (2011). A healthy school start-Parental support to promote healthy dietary habits and physical activity in children: Design and evaluation of a cluster-randomised intervention. *BMC Public Health*, *11*(1), 185.

Nyboe, L., & Lund, H. (2013). Low levels of physical activity in patients with severe mental illness. *Nordic Journal of Psychiatry*, *67*(1), 43-46.

Ogden, C. L., Carroll, M. D., Curtin, L. R., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the United States, 1999-2004. *Journal of the American Medical Association*, *295*(13), 1549-1555.

Ogden, C. L., Carroll, M. D., Kit, B. K., & Flegal, K. M. (2012). Prevalence of obesity in the United States, 2009-2010. *NCHS Data Brief,* 82,1-8

Ohri-Vachaspati, P., DeWeese, R., Crespo, N. C., Todd, M., & Yedidia, M. J. (2013). Social Ecological Model (SEM) and Childhood Obesity: What Do the Data Suggest? *FASEB Journal*, *27*(1_MeetingAbstracts), 842-3.

O'Rahilly, S. (2009). Human genetics illuminates the paths to metabolic disease. *Nature*, *462*(7271), 307.

Pagoto, S. L., Schneider, K. L., Bodenlos, J. S., Appelhans, B. M., Whited, M. C., Ma, Y., & Lemon, S. C. (2012). Association of post‐traumatic stress disorder and obesity in a nationally representative sample. *Obesity*, *20*(1), 200-205.

Papastavrou, E., Efstathiou, G., Acaroglu, R., DA, L., Antunes, M. D., Berg, A., ... Leino-Kilpi, H. E. L. E. N. A. (2012). A seven country comparison of nurses' perceptions of their professional practice environment. *Journal of Nursing Management*, *20*(2), 236-248.

Papastavrou, E., Efstathiou, G., Lemonidou, C., Kalafati, M., Katajisto, J., & Suhonen, R. (2014). Cypriot and Greek nurses' perceptions of the professional practice environment. *International Nursing Review*, *61*(2), 171-178.

Patel, V., Rodrigues, M., & DeSouza, N. (2002). Gender, poverty, and postnatal depression: a study of mothers in Goa, India. *American Journal of Psychiatry*, *159*(1), 43-47.

Park, T., Usher, K., & Foster, K. (2011). Description of a healthy lifestyle intervention for people with serious mental illness taking second‐generation antipsychotics. *International Journal of Mental Health Nursing*, *20*(6), 428-437.

Parschau, L., Barz, M., Richert, J., Knoll, N., Lippke, S., & Schwarzer, R. (2014). Physical activity among adults with obesity: Testing the health action process approach. *Rehabilitation Psychology*, *59*(1), 42.

Phelan, S., Phipps, M. G., Abrams, B., Darroch, F., Schaffner, A., & Wing, R. R. (2011). Randomized trial of a behavioral intervention to *American Journal of Clinical Nutrition*, *93*(4), 772-779.

Poston, L., Bell, R., Croker, H., Flynn, A. C., Godfrey, K. M., Goff, L., ... UPBEAT Trial Consortium. (2015). Effect of a behavioural intervention in obese pregnant women (the UPBEAT study): A multicentre, randomised controlled trial. *The Lancet Diabetes & Endocrinology*, *3*(10), 767-777.

Puhl, R. M., & Heuer, C. A. (2010). Obesity stigma: Important considerations for public health. *Health*, *24*, 252.

Puhl, R. M., Latner, J. D., King, K. M., & Luedicke, J. (2014). Weight bias among professionals treating eating disorders: Attitudes about treatment and perceived patient outcomes. *International Journal of Eating Disorders*, *47*(1), 65-75.

Puhl, R. M., Luedicke, J., & Grilo, C. M. (2014). Obesity bias in training: attitudes, beliefs, and observations among advanced trainees in professional health disciplines. *Obesity*, *22*(4), 1008-1015.

Queen, M., Parker, A., & Crone, D. (2016). Gender perceptions and their impact when referring obese patients for exercise. *Qualitative Research in Sport, Exercise and Health*, *8*(3), 287-300.

Ries, A. V., Blackman, L. T., Page, R. A., Gizlice, Z., Benedict, S., Barnes, K., ... Carter-Edwards, L. (2014). Goal setting for health behavior change: evidence from an obesity intervention for rural low-income women. *Rural and Remote Health*, *14*(2682).

Rose, S. A., Poynter, P. S., Anderson, J. W., Noar, S. M., & Conigliaro, J. (2013). Physician weight loss advice and patient weight loss behavior change: A literature review and meta-analysis of survey data. *International Journal of Obesity*, *37*(1), 118-128.

Royal College of Psychiatrists, (2016). The role of the consultant psychiatrist in adult mental health services. Retrieved from http://www.rcpsych.ac.uk

Rudestam, K. E., & Newton, R. R. (2014). *Surviving your dissertation: A comprehensive guide to content and process*. London: Sage Publications.

Shaibi, G. Q., Konopken, Y., Hoppin, E., Keller, C. S., Ortega, R., & Castro, F. G. (2012). Effects of a culturally grounded community-based diabetes prevention program for obese Latino adolescents. *The Diabetes Educator*, *38*(4), 504-512.

Shaikh, U., Nettiksimmons, J., & Romano, P. (2011). Pediatric obesity management in rural clinics in California and the role of telehealth in distance education. *The Journal of Rural Health*, *27*(3), 263-269.

Sharma, M. (2015). Multi-theory model (MTM) for health behavior change. *WebmedCentral Behaviour, 6*(9), WMC004982.

Sharma, M. (2017). *Theoretical foundations of health education and health promotion* (3rd ed.). Burlington, MA: Jones & Bartlett Learning.

Sharma, M., & Romas, J. A. (2012). *Theoretical foundations of health education and health promotion*. Sudbury, MA: Jones & Bartlett.

Sharma, M., Wagner, D. I., & Wilkerson, J. (2006). Predicting childhood obesity prevention behaviors using social cognitive theory. *International Quarterly of Community Health Education*, *24*(3), 191-203.

Shrivastava, A., & Johnston, M. E. (2010). Weight-gain in psychiatric treatment: Risks, implications, and strategies for prevention and management. *Mens Sana Monographs*, *8*(1), 53.

Shrira, A., Shmotkin, D., & Litwin, H. (2012). Potentially Traumatic Events at Different Points in the Life Span and Mental Health: Findings From SHARE-Israel. *American Journal of Orthopsychiatry*, *82*(2), 251-259.

Sikorski, C., Luppa, M., Kaiser, M., Glaesmer, H., Schomerus, G., König, H. H., & Riedel-Heller, S. G. (2011). The stigma of obesity in the general public and its implications for public health-a systematic review. *BMC Public Health*, *11*(1), 661.

Soares, A. L. G., França, G. V. A. D., & Gonçalves, H. (2014). Household food availability in Pelotas, Brazil: An approach to assess the obesogenic environment. *Revista de Nutrição*, *27*(2), 193-203.

Stanley, S. H., & Laugharne, J. D. (2012). Obesity, cardiovascular disease and type 2 diabetes in people with a mental illness: A need for primary health care. *Australian Journal of Primary hHealth*, *18*(3), 258-264.

Stanley, S. H., Laugharne, J. D., Addis, S., & Sherwood, D. (2013). Assessing overweight and obesity across mental disorders: Personality disorders at high risk. *Social Psychiatry and Psychiatric Epidemiology*, *48*(3), 487-492.

Stark, C. M., Graham-Kiefer, M. L., Devine, C. M., Dollahite, J. S., & Olson, C. M. (2011). Online course increases nutrition professionals' knowledge, skills, and self-efficacy in using an ecological approach to prevent childhood obesity. *Journal of Nutrition Education and Behavior*, *43*(5), 316-322.

Stein, M. B., Jang, K. L., Taylor, S., Vernon, P. A., & Livesley, W. J. (2002). Genetic and environmental influences on trauma exposure and posttraumatic stress disorder symptoms: A twin study. *American Journal of Psychiatry. 159*(10), 1675-1681.

Story, M. T., Neumark-Stzainer, D. R., Sherwood, N. E., Holt, K., Sofka, D., Trowbridge, F. L., & Barlow, S. E. (2002). Management of child and adolescent obesity: attitudes, barriers, skills, and training needs among health care professionals. *Pediatrics*, *110*(1), 210-214.

Sullivan, P. F., Daly, M. J., & O'Donovan, M. (2012). Genetic architectures of psychiatric disorders: The emerging picture and its implications. *Nature Reviews Genetics*, *13*(8), 537-551.

Sullivan, P. F., Neale, M. C., & Kendler, K. S. (2000). Genetic epidemiology of major depression: Review and meta-analysis. *American Journal of Psychiatry*. 157, 1552-1562

Swift, J. A., Hanlon, S., El-Redy, L., Puhl, R. M., & Glazebrook, C. (2013). Weight bias among UK trainee dietitians, doctors, nurses and nutritionists. *Journal of Human Nutrition and Dietetics*, *26*(4), 395-402.

Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine*, *29*(6), 563-570.

Taylor, V. H., Stonehocker, B., Steele, M. A., & Sharma, A. M. (2012). An overview of treatments for obesity in a population with mental illness. *Canadian Journal of Psychiatry*, *57*(1), 13-20.

Taylor, V. H., McIntyre, R. S., Gary Remington, M. D., Levitan, R. D., & Sharma, A. M. (2012). Beyond pharmacotherapy: understanding the links between obesity and chronic mental illness. *Canadian Journal of Psychiatry*, *57*(1), 5.

Thornicroft, G. (2011). Physical health disparities and mental illness: the scandal of premature mortality. *British Journal of Psychiatry*, *199*(6), 441-442.

Tiihonen, J., Haukka, J., Henriksson, M., Cannon, M., Kieseppä, T., Laaksonen, I., ... Lönnqvist, J. (2014). Premorbid intellectual functioning in bipolar disorder and schizophrenia: results from a cohort study of male conscripts. *American Journal of Psychiatry*.

Tovar, A., Guthrie, L. B., Platek, D., Stuebe, A., Herring, S. J., & Oken, E. (2011). Modifiable predictors associated with having a gestational weight gain goal. *Maternal and Child Health Journal*, *15*(7), 1119-1126.

Tsai, A. G., Abbo, E. D., & Ogden, L. G. (2011). The time burden of overweight and obesity in primary care. *BMC Health Services Research*, *11*(1), 1.

Tsai SA, Lv N, Xiao L, Ma J. Gender differences in weight-related attitudes and behaviors among overweight and obese adults in the United States. Am J Mens Health. 2015. doi:1557988314567223.

Usher, K., Park, T., Foster, K., & Buettner, P. (2013). A randomized controlled trial undertaken to test a nurse-led weight management and exercise intervention designed for people with serious mental illness who take second-generation antipsychotics. *Journal of Advanced Nursing*, *69*(7), 1539-1548.

Valmaggia, L. R., Byrne, M., Day, F., Broome, M. R., Johns, L., Howes, O., ... & McGuire, P. K. (2015). Duration of untreated psychosis and need for admission in patients who engage with mental health services in the prodromal phase. *The British Journal of Psychiatry*, *207*(2), 130-134.

Volkmann, T., Wagner, K. D., Strathdee, S. A., Semple, S. J., Ompad, D. C., Chavarin, C. V., & Patterson, T. L. (2014). Correlates of self-efficacy for condom use among male clients of female sex workers in Tijuana, Mexico. *Archives of Sexual Behavior*, *43*(4), 719-727.

Wahlbeck, K., Westman, J., Nordentoft, M., Gissler, M., & Laursen, T. M. (2011). Outcomes of Nordic mental health systems: life expectancy of patients with mental disorders. *The British Journal of Psychiatry*, *199*(6), 453-458.

Walpole, B., Dettmer, E., Morrongiello, B. A., McCrindle, B. W., & Hamilton, J. (2013). Motivational interviewing to enhance self-efficacy and promote weight loss in overweight and obese adolescents: A randomized controlled trial. *Journal of Pediatric Psychology*, *38*(9), 944-953.

Weiden, P. J., Mackell, J. A., & McDonnell, D. D. (2004). Obesity as a risk factor for antipsychotic noncompliance. *Schizophrenia Research*, *66*(1), 51-57.

Welsh, J. A., Nelson, J. M., Walsh, S., Sealer, H., Palmer, W., & Vos, M. B. (2015). Brief Training in Patient-Centered Counseling for Healthy Weight Management Increases Counseling Self-efficacy and Goal Setting Among Pediatric Primary Care Providers Results of a Pilot Program. *Clinical Pediatrics*, 54, 425-429.

Wilkinson, R. & Pickett, K. E. (2010). *The Spirit level: Why greater equality makes societies stronger.* New York, NY: Bloomsbury.

Wise, F. M., Harris, D. W., & Olver, J. H. (2014). Attitudes to obesity among rehabilitation health professionals in Australia. *Journal of Allied Health*, *43*(3), 162-168.

Withrow, D., & Alter, D. A. (2011). The economic burden of obesity worldwide: a systematic review of the direct costs of obesity. *Obesity Reviews*, *12*(2), 131-141.

Woodward, M. (2013). *Epidemiology: study design and data analysis*. CRC Press.

World Bank, (2015). World development Indicators database. Retrieved from http://databank.worldbank.org/data/download/POP.pdf

World Health Organisation, (2015a). Media centre: Mental disorders. Retrieved from http://www.who.int/mediacentre/factsheets/fs396/en/

World Health Organisation, (2015b). Media Centre: Obesity and Overweight. Retrieved from http://www.who.int/mediacentre/factsheets/fs311/en/

Wright, S. M., & Aronne, L. J. (2012). Causes of obesity. *Abdominal Imaging*, *37*(5), 730-732.

Wu, Y. W., Tseng, P. H., Lee, Y. C., Wang, S. Y., Chiu, H. M., Tu, C. H., ... Yang, W. S. (2014). Association of esophageal inflammation, obesity and gastroesophageal reflux disease: from FDG PET/CT perspective. *PloS one*,*9*(3), e92001.

Wysokinski, A., & Kloszewska, I. (2014). Mechanisms of increased appetite and weight gain induced by psychotropic medications. *Journal of Advanced Clinical Pharmacology*, *1*(1), 12-33

Yang, L. H., Purdie-Vaughns, V., Kotabe, H., Link, B. G., Saw, A., Wong, G., … Phelan, J. C. (2013). Culture, threat, and mental illness stigma: Identifying culture-specific threat among Chinese-American groups. *Social Science & Medicine*, *88*, 56-67.

Yumuk, V., Frühbeck, G., Oppert, J. M., Woodward, E., & Toplak, H. (2014). An EASO position statement on multidisciplinary obesity management in adults. *Obesity Facts*, *7*(2), 96-101.

Zatzick, D. F., Marmar, C. R., Weiss, D. S., Browner, W. S., Metzler, T. J., Golding, J. M., ... Wells, K. B. (1997). Posttraumatic stress disorder and functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. *American Journal of Psychiatry, 154*(12), 1690-1695.

Zhu, D. Q., Norman, I. J., & While, A. E. (2013). Nurses' self-efficacy and practices relating to weight management of adult patients: a path analysis. *International Journal of Behavioral Nutrition and Physical Activity*, *10*(1), 1.

Zhu, D. Q., Norman, I. J., & While, A. E. (2011a). The relationship between doctors' and nurses' own weight status and their weight management practices: a systematic review. *Obesity Reviews*, *12*(6), 459-469.

Zhu, D. Q., Norman, I. J., & While, A. E (2011b) "The relationship between health professionals' weight status and attitudes towards weight management: a systematic review." *obesity reviews 12*(5): e324-e337.

Appendix A: WMAB Scale (WMABS)

WMAB Scale (WMABS)

IRB number 06-27-16-0484427

General information

This survey is voluntary which means you may choose not to participate. Please answer the questions below as correctly as possible.

Gender Male Female

Previous training on weight-gain Yes No

If yes, specify _____

Profession Nurse Psychologist Occupational Therapist

Doctor Support worker Social worker

Department CAMHS Old Age General Adult

Ethnicity Black White Asian Mixed race

Hispanic Other (Please specify) ___

Age ___

Number of years of practice___

Weight (Kg or Lb) ___

Height (ft/in) ___

Section 1: Knowledge

(This section assesses your knowledge of weight-gain among the mentally ill including its complications and preventive strategies. Please select one option that applies to you)

	False	True
1. Weight-gain among people who suffer from mental illness is a public health problem.	☐	☐
2. Weight-gain prevalence is higher in people who suffer from mental illness compared to the general population.	☐	☐
3. A combination of factors including biological, environmental and social factors cause weight-gain in people who suffer from mental illness.	☐	☐
4. Psychotropic medications are a potential factor in the cause of weight-gain in people who suffer from mental illness.	☐	☐
5. Weight-gain increases the likelihood of chronic diseases in people who suffer from mental illness compared to the general population.	☐	☐
6. Weight-gain is preventable in people who suffer from mental illness.	☐	☐
7. Dietary control is one of the evidence-based strategies for preventing and controlling weight-gain in people who suffer from mental illness.	☐	☐
8. Increasing physical activity is one of the evidence-based strategies for preventing and controlling weight-gain in people who suffer from mental illness.	☐	☐
9. Appropriate consideration of psychotropic medication choice is helpful in preventing and controlling weight-gain in the mentally ill.	☐	☐
10. The cost of weight-related problems has increased in the National Health Service (NHS).	☐	☐

Section 2: Expectations (Outcome expectations and Outcome expectancies)

(This section assesses your expectations regarding advising mentally ill patients on weight management behaviors. Please select an option that applies to you)

Outcome expectations

	Never	Hardly	Some-	A Lot	Almost

		Ever	times		Always
11. Advising mentally ill patients on weight management behaviors can reduce the risk of developing adverse conditions associated with weight gain.	☐	☐	☐	☐	☐
12. If patients with mental illness adhere to weight management advice, their physical health will improve.	☐	☐	☐	☐	☐
13. Offering mentally ill patients weight management advice can help them control their weight.	☐	☐	☐	☐	☐
14. Advising mentally ill patients on weight management behavior can increase their life expectancy.	☐	☐	☐	☐	☐
15. Advising mentally ill patients on weight management behavior can reduce the cost of weight-related illness.	☐	☐	☐	☐	☐

Outcome expectancies

	Not Important At all	Not Important	Somewhat Important	Important	Very Important
16. How important is the reduction of the risks of diseases associated with weight gain to you?	☐	☐	☐	☐	☐
17. How important is it to you that your patient feels better physically?	☐	☐	☐	☐	☐
18. How important is it to you that your patient controls his/her weight?	☐	☐	☐	☐	☐
19. How important is it to you that your patient's life	☐	☐	☐	☐	☐

expectancy is improved?					
20. How important is it to you that the cost of treating weight-related illnesses is reduced?	☐	☐	☐	☐	☐

Section 3: Situational perception

(This section assesses how your perception affects your ability to advise your mentally ill patients on weight management behaviors. Please select the option that applies to you)

	Never	**Hardly Ever**	**Sometimes**	**A Lot**	**Almost Always**
21. Advising mentally ill patients on weight management behavior is encouraged in the Trust.	☐	☐	☐	☐	☐
22. There is enough time available in my daily work schedule to advise mentally ill patients on weight management behavior.	☐	☐	☐	☐	☐
23. There are enough resources to facilitate advising mentally ill patients on weight management behavior.	☐	☐	☐	☐	☐
24. There are Trust policies for advising mentally ill patients on weight management behavior.	☐	☐	☐	☐	☐

Section 4: Self-efficacy to advice patients on weight management

(This section assesses how confident you are in offering advice to your mentally ill patients on weight management behaviors. Please select the option that applies to you)

	Really Unsure	**Sort of Unsure**	**Some-what Sure**	**Sort of Sure**	**Really Sure**
25. I have a good knowledge base to advise mentally ill patients on weight management behavior.	☐	☐	☐	☐	☐
26. I feel comfortable discussing weight management behavior with my mentally ill patients.	☐	☐	☐	☐	☐
27. I can advise mentally ill patients on weight management behavior even when pressured with time.	☐	☐	☐	☐	☐
28. I can advise mentally ill patients on weight management behavior even when I'm tired from work.	☐	☐	☐	☐	☐
29. I can advise on weight management behavior even without colleagues support	☐	☐	☐	☐	☐
30. I can advise mentally ill patients on weight management behavior even when they have medical health issues to address	☐	☐	☐	☐	☐

Section 5: Goal setting

(This section assesses your ability to set goals and develop plans geared towards advising your mentally ill patients on weight management behaviors. Please select the option that applies to you)

	Really Unsure	**Sort of Unsure**	**Some-what Sure**	**Sort of Sure**	**Really Sure**
31. Addressing obesity issues in my counselling of patients is a goal of mine	☐	☐	☐	☐	☐
32. I intend to counsel my patients about their weight.	☐	☐	☐	☐	☐
33. I intend to counsel my patients about their diet.	☐	☐	☐	☐	☐
34. I intend to counsel more of my patients about their physical activity.	☐	☐	☐	☐	☐
35. It is my goal to address weight with patients along with their mental health issues.	☐	☐	☐	☐	☐
36. It is a goal of mine to become more comfortable talking to patients about their weight.	☐	☐	☐	☐	☐
37. It is a goal of mine to become more comfortable talking to patients about their diet.	☐	☐	☐	☐	☐
38. It is a goal of mine to become more comfortable talking to patients about their physical activity.	☐	☐	☐	☐	☐

Section 6: WMAB

(This section assesses your WMAB. Please select the option that applies to you)

	Never	Hardly Ever	Some-times	A lot	Almost Always
39. I advise my patient on weight management	☐	☐	☐	☐	☐
40. I discuss potential weight-gain as a side effects of psychotropic medications	☐	☐	☐	☐	☐
41. I advise my patients on dietary modifications	☐	☐	☐	☐	☐
42. I advise my patients on the need for increased activity levels	☐	☐	☐	☐	☐

	False	True
43. In the last 7 days, I have offered a weight management advice to a mentally ill patient	☐	☐

Thank you for taking time to participate in the survey

Appendix B: Expert Panel Members for Content and Face Validity of WMABS

Expert Panel Members for Content and Face validity of WMABS

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