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Factors Associated with Weight Intervention Participation among People with Serious Mental Illness

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Abstract

Evidence-based practices effectively reduce weight in people with serious mental illness (SMI), yet participation is limited. Positive relationships between self-efficacy (SE), readiness to change (RtC), and subsequent participation in weight loss interventions have been demonstrated in the general population. The role of SE and RtC in predicting participation in individuals with SMI is explored. A total of 82 participants recruited from a county mental health clinic and a Veterans Affairs (VA) mental health clinic were randomly assigned to a weight management intervention or usual care. RtC and SE were assessed at baseline. Intervention participation rates were gathered. SE significantly correlated with intervention participation ($p<.02$). RtC did not predict significantly over and above SE. A linear combination of all measures was significantly related to participation ($p<.05$). To improve weight intervention participation by individuals with SMI, one direction may be to improve weight loss SE.

Keywords

serious mental illness; weight loss; self-efficacy; readiness to change

Introduction

On average, individuals with serious mental illness (SMI) die 10–20 years prematurely, largely due to obesity-related disorders (Kreyenbuhl et al., 2009). Evidence-based practices (EBPs) have been shown to reduce weight in people with SMI; however, these practices are rarely available, and, when available, people with SMI usually do not use them (Faulkner et al., 2007). Review of the literature reveals significant variation in variables examined across studies, precluding identification of a consistent set of predictors, and calling for

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consideration of theoretically grounded behavioral processes (e.g., motivation) as predictors of participation, rather than demographic variables alone (Moroshko et al., 2011).

Unique cognitive and psychosocial factors associated with SMI likely impact weight loss intervention participation. Cognitive deficits, including executive functioning impairments, are common in individuals with SMI and interfere with one's ability to attend to key information (Kreyenbuhl et al., 2009). Individuals with SMI are frequently impacted not only by stigma from others, but also by self-stigma, or an awareness and concurrence with stereotypes used to describe individuals with SMI. Stigma can impact desire to attend weight programs with non-mental health individuals (Corrigan et al., 2006).

Further, a negative relationship exists between socioeconomic status (SES) and SMI impacting access to high quality fresh food and education (Hudson, 2005; Verhaeghe et al., 2011). Overall, the higher an individual's SES, the greater their access to resources beneficial in protecting their health, including education, power, and social status (Link & Phelan, 1995). Individuals with SMI also have a higher likelihood of being uninsured than the general population, limiting access to personalized weight loss programs, gym memberships, and other safe environments in which to exercise (Verhaeghe et al., 2011).

Positive relationships between both an individual's level of self-efficacy (SE) and readiness to change (RtC), and subsequent participation in weight loss interventions, have been demonstrated within the general population, as well as within the SMI population (Lipschitz, 2015; Marcus et al., 1992; Vancampfort et al., 2014). SE, an individual's confidence in his/her ability to carry out a specific behavior, is a significant predictor of health-related behaviors both in the general population and amongst individuals with SMI (Bandura, 1977; Richardson et al., 2005). Self-stigma can weaken SE and undermine adherence to EBPs in individuals with SMI (Corrigan et al., 2006). RtC, one stage in the transtheoretical stages of behavioral change model validated across a variety of health behaviors, has been shown to function similarly in individuals with SMI and positively correlates with treatment adherence and health-related behavioral changes (Prochaska & Velicer, 1997; Rogers et al., 2001).

Attrition and non-participation in weight services are significant barriers (Moroshko et al., 2011). Little is known about how to improve engagement and, therefore, outcomes within the SMI population. This study explored the extent to which SE and RtC predict intervention participation in individuals with SMI.

Methods

A total of 82 participants were recruited from a large, urban county mental health clinic and a Veterans Affairs (VA) mental health clinic in the same metropolitan area to support generalizability of relevant findings. To be eligible, qualifying psychiatric diagnosis, and receipt of an antipsychotic medication for at least three months prior to enrollment were required. In addition, participants had to have a Body Mass Index (BMI) of 30 or higher (obese), or a BMI of 28 (overweight) with self-reported weight gain of at least 10 pounds in

the three prior months. The study and its purpose were fully explained to interested individuals before completing written informed consent procedures.

Following baseline interview, county clinic participants were randomly assigned to an online weight management program or usual care. VA mental health clinic participants were randomly assigned to the same online weight management program, an in-person weight management group using the same curriculum, or usual care. Due to limited clinician resources, the in-person weight loss intervention was not offered to the county clinic participants. This study examines baseline data and intervention participation rates from the first 82 individuals enrolled in either the online (n=50) or the in-person (n=32) intervention programs at either site. These data are part of a larger sample of 182 total participants (100 of whom were randomized to usual care). The current analyses represent preliminary analyses; analyses of the larger cohort are ongoing. Additional details regarding the methodology, interventions, and their effectiveness are reported elsewhere (Young et al., 2017; Cohen et al., 2014).

The online weight management program consisted of 30 modules (each approximately one half-hour in length) available on any computer with Internet access as well as clinic kiosks. Participants randomized to the online program were encouraged to complete two modules per week. A peer coach with lived experience with SMI called the participant once a week to review learning, support goal achievement, and discuss barriers and facilitators to targeted diet and exercise changes (Cohen et al., 2014; Kinsinger et al., 2009). Participants randomized to the in-person program were invited to attend 20, one-hour weekly group meetings led by a mental health clinician. Both interventions were tailored for the cognitive deficits (e.g., shorter, simpler sentences were used; repetition of key information and take-home points) and psychosocial factors (e.g., highlighting low cost and/or free workout options) commonly impacting individuals with SMI. Attendance for either intervention was calculated by counting completed modules via login data (online program) or attendance logs (in-person group).

Questions from two measures (MOVE! Questionnaire and Self Efficacy for Diet and Exercise Behaviors [SEDEB]) were selected to evaluate diet and exercise related SE and RtC at baseline (Kinsinger et al., 2009; Sallis et al., 1988). Six items from MOVE! Questionnaire were used: “How important is controlling your weight to you personally?; How important is it to you to improve your eating habits?; How confident are you that you can improve your eating habits?; How important is it to you to increase your physical activity?; How confident are you that you can increase your physical activity?; and How satisfied are you with the appearance of your body?.” For the first five items, a 0 to 10 scale was utilized, with 0 signifying “not important/confident at all,” and 10 representing “extremely important/confident.” The sixth item utilized the following scale: very satisfied, moderately satisfied, neither satisfied or dissatisfied, moderately dissatisfied, or very dissatisfied (Kinsinger et al., 2009). Based on existing theory of change, satisfaction with body appearance was reverse scored (i.e., very dissatisfied indicates greater RtC) (Prochaska & Velicer, 1997). The following two SEDEB items were used: “How sure are you that you can do these things…Eat smaller portions?” and “…Get up early, even on weekends, to

exercise?" (Sallis et al., 1988). SEDEB items utilized a 1 to 5 scale with the anchors: 1=I know I cannot, 3=Maybe I can, 5=I know I can.

Questions pertaining to level of confidence (two MOVE! Questionnaire items and two SEDEB items), assess SE. Questions pertaining to level of importance or satisfaction (four MOVE! Questionnaire items), assess RtC.

The study methods were approved by the IRBs of the Greater Los Angeles VA and UCLA; and by the Human Research Protection Program of the County of Los Angeles, Department of Mental Health. The study was conducted between February 2012 and November 2013.

Data Analyses

A principal component analysis (PCA) with oblique rotation was conducted on all items. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO=. 63. Bartlett's test of sphericity (x^2 (28)=180.78, p<.001) indicated correlations between items were sufficiently large for PCA. Two multiple regression analyses were conducted to predict intervention participation. One analysis included the four SE measures as predictors, while a second analysis included the four RtC measures. Additionally, a multiple regression analysis was conducted with all eight items as predictors to determine if the linear combination of all measures was significantly related to participation.

Results

The sample's mean age was 53±10 years old. Participants recruited from the county clinic were significantly younger. The mean age of VA participants was 55±8; the mean age of participants from the county clinic was 46±11. Participants recruited from the VA were predominantly male (92% male), while those from the county clinic were predominately female (53% female). Participants had a mean BMI of 34.5±4.8 (obese range). The average reported monthly income was $1490±$963, income was primarily derived from VA or Social Security Disability Insurance benefits. Participants recruited from the VA clinic were older, $t(24.17)=3.95$, p=.003, reported significantly higher income, $t(72.31)=5.17$, p<.001, and more likely to be male, $t(21.15)=-3.65$, p=.001. Outside of age, income, and sex, participants from the VA did not differ from participants from the county clinic in any meaningful way. See Table 1 for full demographic description of participants.

Seventeen participants (21%) completed all intervention modules/group sessions. An additional 13 participants (16%) completed between 75% and 99% of the modules/sessions but not all, while an additional five participants (6%) completed between 50%−74% of the modules/sessions. In total, 35 participants (43%) completed at least half of the intervention. The 51 participants randomized to the online group completed an average of 48%±43% of the modules. The 31 participants randomized to the in-person treatment group attended an average of 43%±35% of the available groups. Participation rates between county clinic and VA participants did not differ in a meaningful way.

A PCA revealed two components with eigenvalues over one, which, in combination, explained 54% of the variance. The scree plot justified retaining two factors; Factor 1 represents SE and Factor 2 reflects RtC. Table 2 details factor loadings after rotation.

SE was significantly associated with participation (R^2=.13, adjusted R^2=.08, F=2.54, df=4,69, p<.05), suggesting individuals with SMI who have higher levels of SE are more likely to exhibit a higher rate of participation. Conversely, RtC was not significantly associated with participation. Strong conviction of ability to eat smaller portions was most strongly related to participation (*r*=.28, p<.03; partialling out the effects of the other SE measures, *r*=.27, p<.03).

The linear combination of all eight measures was significantly related to participation (R^2=.24, adjusted R^2=.15, F=2.60, df=8,65, p<.02). SE predicted significantly over and above RtC (R^2 change=.14, F=2.99, df=4,65, p<.03). RtC offered little additional predictive power beyond SE (Table 3).

Discussion

The finding that SE is a strong predictor of weight management participation amongst individuals with SMI was expected and parallels research on the importance of SE in pro-heath behaviors within the general population (Lipschitz, 2015; Marcus et al., 1992). Results provide empirical support for social cognitive theory as a framework for predicating intervention participation in the SMI population.

In accordance with the transtheoretical model of change, it was predicted RtC would be positively and significantly related to participation. RtC did not successfully predict participation over and beyond SE. A possible explanation for this finding is that, within the SMI population, the stages of change do not function in the linear, sequential nature expected. Davidson and colleagues (2009) argued the transtheoretical model of change fails to account for the influence of the person-disorder-environment interaction, and places too much weight on an individual's motivation to change without ample consideration of other important factors, such as social support, current symptoms, and access to necessary resources.

Additionally, unconsidered factors—such as enjoyment of intervention programing or participation barriers, including lack of transportation or time to participate — may account for differences in predicting participation. As there is a well-established negative relationship between SES and mental illness, it is likely that low SES contributed to increased participation barriers for some participants (Hudson, 2005). Access to transportation, paid leave for employed participants, and childcare resources for those with childcare responsibilities were not assessed as a part of this study, but may have impacted participation rates across clinics.

Further, familiarly and comfort with both computers and the internet may have impacted participation rates. Computer ownership and Internet use are most common in households with individuals who are between the ages of 35 and 44 (Fil & Ryan, 2014). As such, older participants are less likely to have access to and familiarity with using both computers and

the Internet, which may have impacted their intervention participation. Similarly, limited Internet/computer access and computer skills/knowledge in the SMI population has been described as a potential treatment barrier (Borzekowski, 2009).

Further exploration of factors influencing motivation and the decision to make a change in individuals with SMI would likely contribute to increasing intervention participation. Additionally, factors shown to impact both initial (e.g., tobacco use) and ongoing (e.g., proximity to clinic) engagement in weight management interventions bear consideration (Moroshko et al., 2011). Future analysis including the entire sample from the larger study from which the current data are taken would benefit from inclusion of other factors likely impacting participation (i.e., utilization of peer support, active symptoms during intervention).

While previous research has examined weight management intervention participation within the SMI population, no prior studies have explored the role of SE and RtC. Taken together, prior research and findings from this study indicate that the relationship between SE and participation is robust and should be considered when designing and implementing weight management interventions for individuals with SMI. Including a short intervention bolstering SE (i.e., motivational interviewing focused on identifying prior displays of SE and successful change) before the weight management intervention may be beneficial (Armstrong et al., 2011).

Despite considerable implementation efforts to improve utilization of tailored weight interventions, enrollment and attendance in such programs by the SMI population continues to be a substantial challenge. Considering the positive relationship demonstrated across the literature between higher attendance and better outcomes, understanding key motivational differences demonstrated by individuals with SMI is imperative in order to re-conceptualize factors that increase participation.

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Table 1.

Demographics

	All participants	VA clinic participants	Community clinic participants
	N (%)		
Number of participants	82	63	19
Age			
Under 30	1 (1.2)	0	1 (5.3)
30–39	7 (8.6)	3 (4.8)	4 (21)
40–49	21 (25.6)	13 (20.6)	8 (42.1)
50–59	29 (35.4)	26 (41.3)	3 (15.8)
60–69	23 (28)	20 (31.7)	3 (15.8)
70+	1 (1.2)	1 (1.6)	0
Sex			
Female	15 (18.3)	5 (7.9)	10 (52.6)
Ethnicity			
White	31 (37.8)	20 (31.7)	11 (57.9)
Black	31 (37.8)	28 (44.4)	3 (15.8)
Hispanic	14 (3.9)	9 (14.3)	5 (26.3)
Asian/Pacific Islander	3 (3.7)	3 (4.8)	0
American Indian or Alaskan Native	3 (3.7)	3 (4.8)	0
BMI			
Less than 30	9 (11)	9 (14.3)	0
30–35	49 (59.8)	40 (63.5)	9 (47.4)
36–40	14 (17)	10 (15.9)	4 (21.1)
41–45	8 (9.8)	3 (4.7)	5 (26.3)
46+	2 (2.4)	1 (1.6)	1 (5.2)
Years of Education			
No high school diploma	5 (6.1)	2 (3.2)	3 (15.8)
High school diploma or equivalent	28 (34.1)	23 (36.5)	5 (26.3)
Some college	26 (31.7)	20 (31.7)	6 (31.6)
Associate’s degree	14 (17.1)	12 (19)	2 (10.5)
Bachelor’s degree	5 (6.1)	5 (7.9)	0
Some graduate school	1 (1.2)	0	1 (5.3)
Master’s or doctoral degree	3 (3.7)	1 (1.6)	2 (10.5)
Diagnosis			
Schizophrenia	29 (35.4)	26 (41.3)	3 (15.8)
Schizoaffective disorder	24 (29.3)	15 (23.8)	9 (47.4)
Bipolar disorder	18 (22)	12 (19)	6 (31.6)
Psychosis NOS	6 (7.3)	6 (9.5)	0
Post-traumatic stress disorder	4 (4.9)	4 (6.3)	0

	All participants	VA clinic participants	Community clinic participants
Major depressive disorder with psychosis	1 (1.6)	0	1 (5.2)
Monthly Income	77	58	19
Less than $500	6 (7.8)	2 (3.4)	4 (21.1)
$501-$1000	24 (31.1)	13 (22.5)	11 (57.9)
$1001-$1500	18 (23.4)	15 (25.9)	3 (15.8)
$1501-$2000	15 (19.5)	14 (24.1)	1 (5.2)
$2001-$2500	2 (2.6)	2 (3.4)	0
$2501-$3000	5 (6.5)	5 (8.6)	0
$3001-$3500	3 (3.9)	3 (5.2)	0
$3501-$4000	3 (3.9)	3 (5.2)	0
$4800	1 (1.3)	1 (1.7)	0

Table 2.

Pattern matrix

	Factor 1 Self- Efficacy	**Factor 2 Readiness to Change**
Confidence you can improve eating habits	.716	
Confidence you can increase physical activity	.779	
Confidence you can eat smaller portions	.408	
Confidence you can get up early, even on weekends, to exercise	.641	
Importance of controlling weight		.887
Importance of improving eating habits		.880
Importance of increasing physical activity		.621
Dissatisfaction with appearance of body		.499

Note: Secondary factor loadings < .4 were excluded

Table 3.

Multivariate regression of the effect of SE and RtC on participation in weight intervention

	B	SE	β
Step 1			
Constant	.18	.26	
Importance of controlling your weight	.00	.04	−.01
Importance of improving your eating habits	.08	.05	.08
Importance of increasing your physical activity	−.02	.03	−.12
Satisfaction with appearance of body	.09	.04	.30*
Step 2			
Constant	−.33	.31	
Importance of controlling your weight	−.02	.04	−.09
Importance of improving your eating habits	.04	.05	.19
Importance of increasing your physical activity	−.05	.03	−.26
Satisfaction with appearance of body	.09	.04	.30*
Confidence you can improve your eating habits	.01	.02	.05
Confidence you can increase your physical activity	.05	.02	.28*
Confidence you can eat smaller portions	.09	.05	.22**
Confidence you can get up early, even on weekends, to exercise	−.04	.04	−.12

Note: $R^{2=}$.10 for Step 1, R^2 change=.14 for Step 2 ($p < .03$).

* $p < .05$

** $p = .06$