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Associations between health risk behaviors and perceived health status among individuals with serious mental illness (SMI)

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ABSTRACT

Individuals with Serious Mental Illness (SMI) suffer from chronic medical problems and have greater mortality rates than the general population. The combination of four health-risk behaviors (i.e., physical inactivity, poor diet, smoking, and excessive alcohol intake) may contribute to decreased health status. This study aims to investigate associations between four health risk behaviors and perceived health status of individuals with SMI, so as to provide a better understanding of the attribution of each health-risk behavior to perceived health status. A secondary data analysis of the 2013–2014 California Health Interview Survey was utilized. A total of 1,277 adults were selected based on the criteria of the Kessler Psychological Distress Scale. Hierarchical logistic regression analyses revealed that individuals with SMI who had unhealthy dietary behaviors and were physically inactive were more likely to rate their health status as poor, compared with their counterparts (OR = 0.23, 95% CI [0.10, 0.56] and OR = 0.31, 95% CI [0.10, 0.96], respectively). However, individuals with SMI who had episodes of binge drinking were less likely to rate their perceived health status as poor, but the counterparts tend to rate their health status as more than fair (OR = 2.56, 95% CI [0.10, 0.56]).

KEYWORDS

Perceived health status; SMI; health-risk behaviors; mental disorders; chronic diseases

Background

In 2016, the prevalence of Any Mental Illness (AMI) in the United States was 18.3% (44.7 million) and Severe Mental Illness (SMI) was 4.2%, which is approximately 10.4 million individuals (Substance Abuse and Mental Health Services Administration, 2017). A number of reviews and studies have shown that individuals living with SMI have a shorter lifespan and greater co-morbid health problems than the general population in the United States (Anyato, 2017; Colton & Manderscheid, 2006). The gap of the life expectancy between individuals with SMI and those without SMI in the United States is 25 years (Parks, Svendsen, Singer, Foti, & Mauer, 2006).

In the United States, 9.2% of the general population rated their health as poor or fair in 2015 (National Center for Health Statistics, 2017). Out of 787, however,

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the majority of individuals who had received a mental health service (83.3%) reported their general health as poor or fair (Howard, El-Mallakh, Rayens, & Clark, 2007). It is worth noting that the prevalence of medical conditions among individuals with SMI is greater than the general population (Druss & Walker, 2011; Lee, Rothbard, & Choi, 2016). In addition, 60% of mortality cases among individuals of SMI are attributed to chronic medical conditions, such as premature cardiovascular disease, diabetes, chronic obstructive pulmonary disease, and hepatitis C (Rao, Raney, & Xiong, 2015).

There are multiple factors contributing to increased medical co-morbidity and premature mortality in individuals with SMI. For example, the use of antipsychotic medications, such as olanzapine and clozapine, is associated with the highest risk of metabolic syndrome, and valproic acid can cause significant weight gain (Rao et al., 2015). Socioeconomic deprivation and disparities in health care access also contribute to their poor physical health outcomes (de Hert et al., 2011; Martin et al., 2014).

Beside factors discussed above, a growing body of research has focused on modifiable lifestyle behaviors such as physical inactivity, poor diet, smoking, and excessive alcohol intake (Buhagiar, Parsonage, & Osborn, 2011; Nyboe & Lund, 2013). Those four health-risk behaviors are commonly found among individuals with SMI, and health-risk behaviors are associated with their high rate of morbidity and mortality (Happell, Davies, & Scott, 2012). Scott and Happell (2011) indicated that, "cardiovascular disease and metabolic syndrome can be partly attributed to poor diet and sedentary behavior; respiratory disorders and cancers have been linked to smoking; and HIV risk is increased in those who abuse drugs and alcohol" (p. 593) among individuals with SMI. It is worth noting that increased risks of mortality among individuals with SMI are largely due to poor medical conditions, but their poor medical conditions can be prevented or treated by modifications of health-risk behaviors (Parks et al., 2006).

In order to reduce health risk behaviors of individuals with SMI, a variety of health promotion interventions have been discussed and provided. A systemic review of 24 health promotion programs for individuals with SMI showed significant health benefits and improvement in quality of life via health-risk behavior managements for nutrition, physical activity, and tobacco use (Bartels & Desilets, 2012). It was indicated that one of the key factors that contribute to changing health-risk behaviors in the interventions was motivating individuals with SMI during the participation of their intervention (Moon, 2016; Naslund, Aschbrenner, Scherer, Pratt, & Bartels, 2016; Tidey, 2012). To motivate individuals with SMI to change their unhealthy lifestyle, it is important to see their self-evaluation of overall health status and, if needed, raise their awareness of current health status since health motivation is affected positively and negatively by their health perception (Bukman et al., 2014).

It is well known that health-risk behaviors are significant predictors of health status among individuals with SMI. However, most research has used objective health status indicators rather than subjective health status, which is a self-assessment of overall health status based on one's own perception. Despite the importance of this topic, only a limited number of studies have been done to examine perception on health status of individuals with SMI and its association with four important health-risk behaviors, respectively—i.e., physical inactivity, poor diet, smoking, and excessive alcohol intake. Therefore, further research in this topic is warranted to assess the link between health-risk behaviors and perceived health status of individuals with SMI.

The aim of this research is to identify how individuals of SMI evaluate their subjective health status and its relationship with health-risk behaviors with a population sample. Through examining the association between health-risk behaviors and perceived health status, we can provide a better understanding of the determinants of perceived health, particularly health-risk behaviors, and, if any, evidence for the importance of health promotion programs (e.g., health risk behavioral management) among individuals with SMI. It was hypothesized that health-risk behaviors (i.e., physical inactivity, poor diet, smoking, and excessive alcohol intake) will be associated with perceived health status among individuals with SMI, even after adjusting for sociodemographic characteristics and health-related factors (i.e., co-morbidity and obesity).

Methods

Data resources

A secondary data analysis of the 2013–2014 California Health Interview Survey (CHIS) wave was utilized to investigate the associations between health risk behaviors and health status among individuals with SMI in California. This study was approved by the Institutional Review Board (IRB) at Fordham University to use CHIS. CHIS, the largest population-based state health survey, has been conducted since 2001 across the two-year cycle by using a random-digit telephone method (CHIS, 2013). CHIS captures California's rich diversity in race and ethnicity by including a sufficient number of Whites, Latinos, Asians, Pacific Islanders, African Americans, and American Indians/Alaska Natives with oversampling Vietnamese and Koreans (CHIS, 2013). As for 2013–2014 waves, the overall response rate was 44.8%. CHIS data applied weights to the sample data for the probability of selection and a variety of other factors in order to produce non-institutionalized population estimates.

To select the samples in the present study, Kessler Psychological Distress Scale (K6) was used to determine the presence of SMI (Kessler et al., 2002). The K6 scale was derived from six questions asking about the following feelings during the past 30 days: nervous, hopelessness, restless or fidgety, depressed, everything was an effort, or worthless. The response categories were: none, a little, some,

most, and all of the time, with 0–4, respectively. Total scores of the K6 ranges from 0 to 24, indicating that respondents with score ≥13 have a non-specific serious mental illness (Lee et al., 2012). A measure of internal consistency reliability is high (Cronbach α = 0.89) for the K6 scales, and high validity was also reported (Kessler et al., 2003). Among a total of 40,240 CHIS adult sample, 1,342 adults were considered as individuals with SMI, but 43 individuals with SMI were deemed ineligible due to their physical limitation of walking, and 22 individuals were also excluded because of missing data for the present study. The final sample size in the study was 1,277 individuals with SMI, which was comprised of about 3.17% of CHIS adults sample.

Measures

Outcome variables

The variable of health status was measured by using a single item asking respondents to rate their health as follows: "Would you say that in general your health is excellent, very good, good, fair, or poor?" The existing literature consistently demonstrates that this single item measurement of perceived health is subjective and simple, but also a robust and effective measure of individual's health condition (Feng, Zhu, Zhen, & Gu, 2015). The perceived health status question is strongly associated with more extensive health scales and physician's ratings, which indicates a high degree of construct validity, and showed apparent validity as a maker for health and health behaviors (Haddock et al., 2006; Shields & Shooshtari, 2001). The answers were converted into two categories (0 = poor, 1 = fair/good/very good/excellent).

Independent variables

The independent variables included four health-risk behaviors. The health-risk behaviors were classified as physical inactivity, tobacco use, unhealthy dietary behaviors, and binge drinking.

Physical inactivity was assessed by the recommended level of physical activity for adults. According to World Health Organization (2018), at least 150 minutes of moderate-intensity aerobic physical activity per week is recommended for adults. In CHIS, two questions about walking for leisure (i.e., frequency of walking and duration of walking for fun, relaxation, exercise, or to walk the dog) were collected. To measure whether respondents met the recommended physical activity levels per week or not, we combined two questions into an indicator of minutes of walking for leisure per week (0 = walked at least 150 minutes per week; 1 = walked less than 150 minutes per week). The questions were given with three response categories: yes, no, or unable to walk. Individuals who answered "unable to walk" were excluded from the final sample.

The variable of unhealthy dietary behavior was measured with the following question: "How often can you find fresh fruits and vegetables in

your neighborhood?" The questions were given with seven response categories, including "never," "sometimes," "usually," "always," and "does not eat/shop for fruits and vegetables." The answers were converted into two categories (0 = sometimes, usually, and always; 1 = doesn't eat/shop for fruits and vegetable and never eat/shop).

Binge drinking was assessed with one standard question and two contingent questions: "during the past 12 months, did you have any kind of alcoholic drink?", " (if you had any kind of alcoholic drink and identified yourself as male), "during the past 12 months, about how many times did you have 5 or more alcoholic drinks in a single day?", and "(if you had any kind of alcoholic drink and identified yourself as female), during the past 12 months, about how many times did you have 4 or more alcoholic drinks in a single day?" In the two contingent questions, drink was defined a 12-ounce can or glass of beer, a 5 ounce glass of wine, a mixed drink, or a shot of liquor. The three questions were collapsed into a single question with six response categories: no binge drinking during the past year; once a year; less than monthly but more than once a year; monthly; less than weekly but more than monthly; and daily or weekly. In the final model of regression analysis, due to very small frequencies for some levels of response categories, binge drinking was recoded into the dichotomous variable (0 = no binge drinking; 1 = binge drinking) whether or not respondents had an episode of binge drinking during the past 12 months.

The variable of tobacco use was assessed with respondents' current smoking status. Respondents' current smoking status was measured with the following two questions: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you now smoke cigarettes every day, some days or not at all?" Respondents who smoked at least 100 or more cigarettes during their entire life and currently smoked every day or some days were considered as current smokers. The currently smoking individuals with SMI were coded as 1 and non-smoking individuals with SMI were coded as 0 (non-smoker = 0, current smoker = 1).

Confounders

In this study, a comprehensive list of confounders, which also have been documented in literature as significant independent predictors of health status, were conceptually identified: socioeconomic status (i.e., age, gender, race, marital status, educational attainment, poverty status, insurance status, and employment), obesity, and chronic diseases (i.e., asthma, diabetes, hypertension, and heart disease) (National Research Council (US) Committee on National Statistics, 2010).

Statistical analyses

Due to the two-stage random-digit-dial (RDD) sample design of CHIS, complex survey data analysis procedures were used in STATA version 14.0 (StataCorp, 2015). All analyses were performed on weighted data, in order to reduce possible non-respondent bias and to produce point estimates for the CHIS results. By doing so, point estimates from the CHIS sample can represent the California population's health-risk behaviors and perceived health status. Univariate analyses were used to describe sociodemographic characteristics and prevalence estimates of health risk behaviors of the sample.

Since perceived general health status was collapsed into a dichotomous variable, logistic regression analyses were conducted to examine which health-risk behaviors were associated with perceived general health among individuals with SMI, after adjusting for confounders. The odds ratios (ORs) of the associations between perceived health status and each health-risk behavior were calculated for statistically significance ($\alpha \leq 0.05$).

Results

The demographic distribution of study sample is described in Table 1. Of 1,277 individuals with SMI, over half were female (60.07%) and more than a third were married or lived with a partner (41.70%). The large majority of them had higher levels of high school graduates (71.19%) and had medical insurance coverage (78.96%). According to the employment status, about two-thirds of the individuals with SMI were unemployed (63.1%), and just over a third lived below the poverty line (34.76%). One of the remarkable demographic information was obesity: 73.2% were obese, calculated by the BMI index. The majority of individuals with SMI (65.58%) reported that they have at least one of the chronic diseases, including asthma, diabetes, hypertension, and heart disease.

In Table 2, 75.72% of individuals with SMI rated their health as higher than poor. Also, 27.08% of the individuals with SMI reported that they were smokers, and 30.92% reported that they had episodes of binge drinking in past 12 months. However, only 10.55% of them met physical activity guideline (i.e., walking at least 150 minutes per week for leisure). More than 90% of individuals with SMI reported that they consumed vegetables. Despite the high rates of obesity, 75% of individuals with SMI rated their health as higher than poor.

In advance, a multicollinearity test was performed. The Variance Inflation Factor (VIF) and tolerance statistics do not indicate serious collinearity among variables in the survey logistic model (VIF = 1.20; tolerance = 0.83). In Table 3, the results of hierarchical logistic regression analyses showed the associations of four different types of health-risk behaviors on the perceived health status

Table 1. Demographic characteristics of individuals with severe mental illness in California (N = 1,277).

	% (weighted)	Confidence interval *(LB-UB)*
Gender		
Male	39.93	34.79–45.30
Female	60.07	54.70–65.21
Age		
18–34	27.38	22.78–32.53
35–49	28.65	24.10–33.68
50–64	33.25	28.36–38.52
65+	10.72	8.08–14.08
Race		
Whites	29.96	25.45–34.89
Non-Whites	70.04	65.11–74.55
Marital Status		
Never Married	31.65	27.32–36.31
Married/Living with Partner	41.70	35.70–47.96
Divorced/Separated/Widowed	26.65	22.13–31.72
Poverty		
Poor	34.76	29.73–40.17
Non-Poor	65.24	59.83–70.27
Educational Attainment		
Less than High School	28.81	23.57–34.69
High School	27.71	22.99–32.99
Some colleges	28.11	23.97–32.67
BA+	15.37	12.27–19.08
Employment		
Unemployed	63.10	56.82–68.96
Employed	36.90	31.04–43.18
Insurance Status		
Uninsured	21.04	17.04–25.68
Insured	78.96	74.32–82.96
Obesity		
Obese	73.20	68.32–77.57
Non-Obese	26.80	22.43–31.68
# of chronic diseases		
0	34.42	29.06–40.21
1	34.34	29.56–39.46
2	22.87	18.62–27.76
3	7.234	4.81–10.74
4	1.133	.45–2.83

LB= Lower Bound; UB=Upper Bound

after controlling for age, gender, race, marital status, educational attainment, poverty status, insurance status, employment, and obesity.

In model 1, among sociodemographic factors, only the number of chronic diseases was a significant factor for perceived health status, indicating a negative correlation (OR = 0.52, 95% CI [0.39, 0.70]). In model 2, after we adjusted for all covariates, binge drinking was associated with general health condition. The individuals with SMI who had episodes of binge drinking in the past 12 months were more likely to rate their health as higher than poor, as compared to their counterparts who had no episodes of binge drinking (OR = 2.56, 95% CI [1.21–5.42]). In addition, physical inactivity was

Table 2. Health-risk behaviors and health status of individuals with SMI (N = 1,277).

	% (weighted)	Confidence interval *(LB-UB)*
Current Smoker	27.08	22.59–32.08
Binge Drinker	30.92	25.38–37.08
Unhealthy Diet	8.78	6.03–12.61
Physical Inactivity	89.45	85.79–92.25
Health Status		
Excellent	3.797	2.31–6.18
Very good	8.027	5.68–11.23
Good	21.05	16.83–26
Fair	42.84	36.83–49.07
Poor	24.28	19.77–29.46

LB= Lower Bound; UB=Upper Bound

a significant predictor of general health condition, indicating individuals who did not walk at least 150 minutes per week for leisure and exercise in past week were less likely to rate their perceived health status as higher than poor, as compared to their counterparts (OR = 0.31, 95% CI [0.10, 0.96]). Unhealthy dietary behaviors were also associated with perceived health status. The individuals who did not eat or shop for vegetables were less likely to rate their health as higher than poor (OR = 0.23, 95% CI [0.10, 0.56]). The number of chronic diseases was negatively associated with perceived health condition among individuals with SMI in model 2 (OR = .49, 95% CI [0.0.38, 0.64]).

Discussion

The goal of this study was to investigate the associations between health-risk behaviors, which may be correlated with excess morbidity and pre-mature mortality of individuals with SMI, and their perceived health status, which is an indicator of overall physical, mental, and social well-being. The results showed statistically significant associations between physical inactivity and perceived health status. Based on the findings of this study, individuals with SMI who walked for physical activity 150 minutes per week reported higher perceived health status than individuals with SMI who did not walk at least 150 minutes per week. This result supports previous research, revealing that sufficient levels of physical activity are positively associated with perceived health status in adults (Jepsen, Dogisso, Dysvik, Andersen, & Natvig, 2014; Kaleta, Makowiec-Dąbrowska, Dziankowska-Zaborszczyk, & Jegier, 2006). Among individuals with SMI, physical activity is an important lifestyle intervention for promoting physical and mental health, and improve their health-related quality of life (Moon, 2016; Oeland, Laessoe, Olesen, & Munk-Jørgensen, 2010) due to the effect of the increase in social interaction, meaningful use of time, purposeful activity, and empowerment (Alexandratos, Barnett, & Thomas, 2012). Our finding indicates that unhealthy diet among individuals with SMI is negatively associated with their levels of perceived health status. This is

Table 3. Hierarchical logistic regression analysis results for association of unhealthy lifestyle behaviors and perceived health status (Incorporating weights) (N = 1,277).

Variables	Model 1	Model 2
Socio-demographic Factors	OR [CI]	OR [CI]
Age		
18–34		
35–49	0.66[0.26–1.65]	0.62 [0.23-1.66]
50–64	0.66[0.29–1.51]	0.80 [0.31–2.08]
65+	0.56[0.23–1.41]	0.83 [0.28–2.44]
Gender		
Male		
Female	0.85[0.46–1.58]	0.82[0.46–1.48]
Education		
Less than high school		
High school	1.33 [0.61–2.90]	1.43[0.63–3.22]
Some college	0.91 [0.44–1.90]	0.81[0.40–1.65]
BA/Graduate	0.86 [0.35–2.13]	0.91[0.37–2.25]
Race		
Whites		
Non-whites	1.40[0.74–2.66]	1.55[0.82–2.95]
Marital status		
Never married		
Married, living with partner	0.74[0.32–1.72]	0.62 [0.28–1.38]
Divorced, separated, widowed	0.84[0.39–1.81]	0.73 [0.32–1.64]
Insurance		
Insured		
Uninsured	0.91[0.41–2.03]	0.84 [0.37–1.91]
Poverty		
Poor		
Not-poor	1.47[0.87–2.49]	1.38 [0.82–2.34]
Obesity		
Obese		
Not obese	0.94 [0.49–1.81]	0.98[0.49–1.94]
Employment		
Unemployed		
Employed	1.30 [0.67–2.53]	1.39 [0.74–2.61]
Number of chronic diseases	0.52 [0.39–0.70]***	0.49[0.39–0.64]***
Unhealthy lifestyle behaviors		
Physical inactivity		0.31[0.10–0.96]*
Unhealthy diet/vegetable consumption		0.23[0.10–0.56]***
Binge drinking		2.56[1.21–5.42]**
Current smoking		0.81[0.43–1.53]*

Note. Values are expressed as OR (odds ratios) and CI (95% confidence intervals). * $P \leq 0.05$, ** $P \leq 0.01$, and *** $P \leq 0.001$. All asterisks are compared to the first group.

consistent with the study of Blázquez, López-Torres, Rabanales, López-Torres, and Val (2016), indicating that levels of perceived health status is positively associated with a healthy diet. Poor dietary intake (less vegetable consumption) is common in individuals with SMI (Hahn et al., 2014), and enriched food environment and dietary practices are needed for improving the physical health of individuals with SMI. (Cabassa, Siantz, Nicasio, Guarnaccia, & Lewis-Fern ández, 2014). Our findings suggest that physical inactivity and unhealthy diet

need to be carefully treated because these two health-risk behaviors are associated with overall health of individuals with SMI.

Contrary to our hypothesis, excessive alcohol consumption is positively associated with perceived health status among individuals with SMI. Positive effects of alcohol consumption on health status have been a controversial topic for the last two decades. A large body of research indicated that while binge/heavy drinking is known to be an unhealthy behavior, moderate alcohol consumption may have some advantageous effects on health (Artero, Artero, Tarín, & Cano, 2015; Mostofsky, Mukamal, Giovannucci, Stampfer, & Rimm, 2016; Temple, 2012). However, it could not be overlooked that alcohol consumption serves as an important contributing factor to most chronic diseases (Chikere & Mayowa, 2011). Recent research has revealed that suggestions from a large body of previous research about benefits of light or moderate alcohol consumption on reduced all-cause mortality could be biased, and their results do not reflect a causal relationship (Goulden, 2016). Because of high prevalence of excessive alcohol consumption among individuals with SMI and its adverse effect on health, our finding must be treated with great care.

According to our hierarchical logistic regression analyses, current smoking status is not statistically associated with perceived health status among individuals with SMI. However, it is hard to conclude that smoking status is not related with health status among individuals with SMI. Although our data did not prove the relationship between smoking status and perceived health status, current smokers with SMI were more likely to rate their health as poor. Inconsistent with our findings, another research in the general population using CHIS 2007 dataset found statistical significance that current smokers in the general population were four times more likely to rate their health as poor than non-smokers (Mahmoud, 2015). The proportion of smokers among individuals with SMI is high compared to the general population, and smoking is associated with their increased mortality, more symptoms of mental illness, increased hospitalizations, and requirement for higher dosages of psychiatric medication (Baker, 2017). Therefore, a huge effort has been made to decrease smoking rate of individuals with SMI in the mental health settings. However, one of the big barriers to smoking cessation is a perception that individuals with SMI are not interested in quitting (Annamalai, Singh, & O'Malley, 2015). Our finding may present the reason why individuals with SMI are not interested in quitting smoking. Compared to the general population, smokers with SMI may have a perception of better health status, and their relatively high health perception could be related with decreased interest in quitting.

Perceived health status is an indicator of overall health, but it has its limits in terms of possibility of bias due to being highly subjective. Especially, cognitive impairment is one of the major hallmarks of individuals with SMI (Pratt, Mueser, Bartels, & Wolfe, 2013), and their cognitive

impairment might cause trouble making decisions and judgments on their own health. According to the health belief model, perceived susceptibility, severity, and benefits are required prior to take an action to modify health behavior (Green & Murphy, 2014). Perceived health status, in addition to its role as an indicator of overall health based on their own subjective perception of self, can predict individual's help-seeking behaviors and health service use (Kraja, Këlliçi, & Çakërri, 2013). The positive association between alcohol consumption and perceived health status may address that individuals with SMI who have excessive alcohol consumptions are less likely to seek help for these behaviors because they rate their health as higher than poor. According to smoking status, current smokers with SMI in this study are less likely to be interested in quitting compared to the general population because they might rate their perceived health as good. Further research is needed to determine whether health-risk behaviors are also associated with more objective health status measures such as health-related quality of life and chronic diseases. Furthermore, finding causal relationships between health-risk behaviors and perceived health status is recommended. Modifying health-risk behaviors are essential to lowering the risk of preventable physical health problems experienced by individuals with SMI. Therefore, our findings suggest that mental health professionals should understand the strengths and limitations of perceived health status reported by individuals with SMI, and assess the levels of willingness to change their health-risk behaviors and unbiased health status with objective measurements.

Limitations

Our findings should be considered within the context of the study's limitations. One of the major limitations is that the data used in the study is cross-sectional, so no causality between health risk behaviors and perceived health status can be inferred. The K6 is a self-reported measure that may cause failure of capturing the true prevalence of SMI by over/under-estimation: Would "over/under-estimation" be better here?> of mental health conditions, while it is a validated measure. Second, it is possible to have a sampling bias because individuals with SMI could have severe cognitive dysfunction, which in turn causes obstruction to participating in the survey. One of the major problems for individuals with SMI is cognitive dysfunction that affects independent living skills and academic or work performance (Medalia & Revheim, 2002; Rempfer, Hamera, Brown, & Cromwell, 2003). Therefore, individuals with SMI are more likely to be excluded from the survey. In fact, while the prevalence of SMI in U.S. population was 4.0% in 2016, only about 3.2% of the CHIS adult sample was screened for SMI. Last, this study used

only one question to ask about health status for a dependent variable. Since individuals with SMI are more likely to have cognitive impairment, one question might not fit for measuring objective health status of individuals with SMI. In order to examine the influences of health-risk behaviors on health of individuals with SMI, further study is recommended to conduct a randomized controlled design research and use objective measurement.

Conclusion

It has been known for some time that individuals with SMI have poor physical health that might result from their unhealthy lifestyles. The overall findings of this study provide additional information for the associations between health risk behaviors and perceived health status among individuals with SMI. These unhealthy behaviors (i.e., physical inactivity, poor diet, smoking, and excessive alcohol intake) are more likely to be major contributors to the health problems. This study found that individuals with SMI who are physically active and eat healthy have higher perceived health status. Therefore, it is recommended to provide services for increasing physical activity and changing healthy diet for overall health status. However, binge drinkers among individuals with SMI also indicated that they tend to perceive themselves as healthy, and smokers with SMI are less likely to perceive their health as poor compared to the general population. Relevant professionals should pay attention to the discrepancy between health status in subjective perception and in reality of individuals with SMI, in terms of smoking status and alcohol consumption. It is noteworthy that perceived health is an important indicator that predicts help-seeking behaviors and changes in health behaviors. In order to prevent negative results from unhealthy behaviors, relevant professionals should have a better understanding of unhealthy behaviors and perceived health status. In doing so, individuals with SMI can receive appropriate help from healthcare providers and mental health service providers.

Disclosure statement

No potential conflict of interest was reported by the authors.

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