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Schizophrenia Research 62 (2003) 73–76

SCHIZOPHRENIA
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Body mass index and quality of life in community-dwelling patients with schizophrenia

Martin Strassnig, Jaspreet Singh Brar, Rohan Ganguli*

Western Psychiatric Institute and Clinic, University of Pittsburgh Medical Center, 3811 O'Hara Street, Pittsburgh, PA 15213-2593, USA

Received 27 March 2002; received in revised form 20 September 2002; accepted 25 September 2002

Abstract

Objective: To examine the associations between sociodemographic variables, body weight and quality of life in schizophrenic outpatients. **Methods:** Assessments included an interview to obtain sociodemographic data, administration of a Quality of Life questionnaire (the MOS SF-36) and measurement of height and weight. Body mass index was calculated (kg/m^2). SF-36 subscores were examined for statistical differences based on BMI categories: healthy weight ($\text{BMI} \leq 24.9$), overweight ($\text{BMI} 25\text{--}29.9$) and obese ($\text{BMI} \geq 30$). Correlations with sociodemographic variables were also examined. **Results:** Body weight was inversely correlated (level $p \leq 0.005$) to the SF-36 items: physical functioning (PF, -0.452), role limitations due to physical functioning (-0.279), role limitations due to emotional functioning (-0.256), vitality (-0.200), general health (GH, -0.367) and physical component score (PCS, -0.400). Mental component score (MCS) was not significantly correlated to body weight. When comparing quality of life across BMI categories, obese subjects had worse physical functioning ($p \leq 0.0005$) and general health ($p \leq 0.005$), reported more role limitations due to emotional functioning ($p \leq 0.05$) and a lower physical component score ($p \leq 0.005$). Mental component score was not significantly influenced by BMI. **Conclusions:** Quality of life in schizophrenic patients is related to body weight. The burden of obesity is primarily experienced as a physical problem.

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Keywords: Body mass index; Quality of life; Community-dwelling patient

1. Introduction

Body weight of the population has increased over the last years (Mokdad et al., 1999) and can be linked to a number of serious comorbidities (National Task Force on the Prevention and Treatment of Obesity, 2000).

Apart from higher morbidity and mortality rates, overweight subjects are also more likely to experience impaired quality of life (Han et al., 1998). Quality of Life (QOL) refers to the subjective impact of an illness or condition onto the physical and mental well-being, expressed by self-report.

Schizophrenic patients are particularly at risk for high body weight (Allison and Casey, 2001) and are also known to have a low QOL (Gupta et al., 1998). However, while the relation of excess body weight to the QOL in otherwise healthy subjects has been

* Corresponding author. Tel.: +1-412-624-1103; fax: +1-412-624-1107.

E-mail address: gangulir@msx.upmc.edu (R. Ganguli).

studied extensively (Lean et al., 1999), the impact of body weight on the quality of life of schizophrenic patients has not been quantified.

We therefore decided to examine the associations between body weight and the self-reported quality of life of schizophrenic patients.

2. Methods

One hundred and forty-three schizophrenic subjects took part in a comprehensive nutritional assessment (Strassnig et al., in press). Along with the nutritional evaluation, subjects provided sociodemographic information and completed the MOS 36-Item Short Form Health Survey (Russo et al., 1998). Body weight and height were measured in kilograms (kg) and meters (m) and body mass index was calculated (kg/m^2). Subjects were classified as normal weight if BMI was below 25, overweight if BMI was between 25 and 29.9, and obese if BMI was 30 or above, in accordance with NHLBI guidelines. Written informed consent was obtained according to procedures approved by the University of Pittsburgh Biomedical Institutional Review Board.

The MOS SF-36 quality of life questionnaire is designed to examine eight different items of functioning: physical functioning, role limitations due to physical problems, vitality, bodily pain, social functioning, role limitations due to emotional problems, mental health and general health (Ware et al., 1993). The four domains: physical functioning, role limitations due to physical problems, bodily pain and general health are then summarized into a physical component score (PCS), whereas the four domains: vitality, social functioning, role limitations due to emotional problems and mental health constitute the mental component score (MCS). PCS and MCS alone have been shown to account for 85% of reliable variance of the eight SF-36 subscores, without significantly losing information (Ware et al., 1994a).

SPSS (for windows, version 10) software was employed for data analysis. Descriptive analysis and frequency counts were carried out. The measures obtained through the SF-36 questionnaire were compared to population standards (Ware et al., 1994b) and examined for correlations with body weight. Student's *t*-tests, and where appropriate, analysis of variance

(ANOVA) and Bonferroni tests were employed to look for statistical differences between the means of two or more variables.

3. Results

We studied 143 patients, carrying a diagnosis of Schizophrenia ($N=67$, 46.9%), Schizoaffective Disorder ($N=52$, 36.4%) and Psychotic Disorder NOS ($N=24$, 16.8%). Seventy-seven (53.8%) were males and sixty-six (46.2%) were females. Average age was 43.3 years (± 8.6). Mean body mass index of study participants was 32.8 (± 7.8).

Regarding living arrangements, 43 (30.1%) lived independently, whereas 100 (69.9%) lived in supervised housing (boarding homes, halfway houses, supervised group homes, skilled nursing facilities). At time of the interview, 35 (24.5%) were employed and 108 (75.5%) were not. Educational background was fairly diverse: 22 subjects (15.4%) had not finished high school, 65 (45.2%) had finished high school or obtained a GED (high school equivalent), and 56 (39.2%) reported at least some college attendance.

SF-36 scores of study subjects were compared to a standardized US population score and are shown in Table 1.

Table 1
SF-36 scores of the general population and of study participants

SF-36 items	General population sample, $N=2474$		Study sample, $N=143$	
	Score	S.D. \pm	Score	S.D. \pm
Physical functioning (PF)	84.2	23.3	72.2*	26.2
Role physical (RP)	80.9	34.0	63.3*	38.4
Role emotional (RE)	81.3	33.0	53.6***	41.5
Mental health (MH)	74.4	18.1	65.0*	20.6
Vitality (VT)	60.9	20.9	52.4	21.2
Social functioning (SF)	83.3	22.7	67.1*	25.6
General health (GH)	71.9	20.3	56.0	22.5
Bodily pain (BP)	75.2	23.7	66.7**	28.3
Mental component score (MCS)	50.0	10.0	43.3*	11.3
Physical component score (PCS)	50.0	10.0	45.4	9.7

* $p < 0.05$.

** $p < 0.005$.

*** $p < 0.0005$.

The study subjects reported significantly more physical problems (PF), more problems with work or other daily activities as a result of inadequate physical health (RP) and emotional well-being (RE), were more challenged in terms of their mental health (MH) and social activities (SF), and experienced more physical pain (BP) than subjects in the general population. Their mental component summary score (MCS) was also significantly lower. No statistically significant differences were found in terms of the physical component score (PCS).

The study sample was then further examined with respect to body weight as a predictor of quality of life. Correlations with SF-36 items were calculated, and the BMI groups healthy weight, overweight, obese, as adopted by the National Heart, Lung and Blood Institute (1998) were used to analyze the respective BMI categories for statistical differences in quality of life (Table 2).

Body weight was inversely correlated to the SF-36 items physical functioning (Pearson correlation coefficient $r = -0.452$), role limitations due to physical functioning ($r = -0.279$), role limitations due to emo-

tional functioning ($r = -0.256$), vitality ($r = -0.200$), general health ($r = -0.367$) and the physical component score ($r = -0.400$). The mental component summary score was not significantly correlated to body weight. (All correlations were calculated at significance level $p < 0.005$.)

When comparing quality of life across BMI categories, obese subjects reported worse physical functioning (PF) and general health (GH) had more problems due to bad emotional functioning (RE) and a lower physical component score (PCS) than both overweight subjects and subjects of healthy weight. Mental component score was not significantly influenced by BMI.

4. Discussion

As expected, the schizophrenic study subjects had a significantly lower quality of life than subjects in the general population. Low quality of life of schizophrenic patients has been consistently reported in the literature, despite often differing methods used to assess QOL (Lehman et al., 1982; Sullivan et al., 1989).

Excess body weight strongly influenced quality of life in the study population, and was primarily perceived as a physical problem. Overall mental functioning was not further affected by increasing body weight, yet obese subjects reported more role limitations due to worse emotional functioning, suggesting some psychosocial distress related to their weight (Kawachi, 1999).

Only a handful of studies have examined diet and nutrition in patients with schizophrenia and its association, if any, with body weight or diabetes. Studies completed in Scotland and Oxford, UK have shown that the diet in patients with schizophrenia is high in fat and low in fiber and vitamins as compared with the general population (McCreadie et al., 1998). Other studies too have concluded that obesity in schizophrenia may primarily result from poor dietary choices (Brown et al., 1999). In a recently concluded study, we have observed that patients with schizophrenia consume more food and hence calories than their age and gender referenced population controls (Strassnig et al., in press). Wirshing et al. (1999) report that efforts to reverse antipsychotic-associated weight gain appeared to have some success, except for patients taking clo-

Table 2
SF-36 Items across BMI classes

SF-36 items	Healthy weight BMI ≤ 24.9 , N = 25		Overweight BMI 25–29.9, N = 32		Obese BMI ≥ 30 , N = 86	
	Score	S.D. \pm	Score	S.D. \pm	Score	S.D. \pm
Physical functioning (PF)	88.8	11.8	80.2	23.8	64.4***	27.0
Role physical (RP)	69.0	34.8	73.4	34.2	57.8	40.3
Role emotional (RE)	76.0	32.7	55.2	42.0	46.5*	41.6
Mental health (MH)	69.3	22.4	68.6	19.2	62.4	20.4
Vitality (VT)	57.6	22.1	56.8	21.0	49.2	20.6
Social functioning (SF)	68.0	28.4	71.4	24.8	65.3	25.2
General health (GH)	67.2	19.4	62.4	20.5	50.3**	22.3
Body pain (BP)	70.0	26.3	70.3	28.2	64.4	28.9
MCS	45.8	13.1	44.1	10.8	42.3	10.9
PCS	49.2	7.5	48.8	8.7	43.1**	10.0

* $p < 0.05$.

** $p < 0.005$.

*** $p < 0.0005$.

zapine. Ball et al. (2001) used the Weight Watchers weight loss program in 21 patients who had olanzapine-related weight gain. Only 11 patients completed the program and weight loss was significant for male patients only. Our own preliminary studies of a behavioral intervention in obese and overweight schizophrenics suggest a robust short-term weight loss in about half of the participants (Ganguli et al., 2002).

The patients' subjective assessment of quality of life is considered to be a critical outcome in the care of individuals with schizophrenia (Steinwachs et al., 1996). Keeping this in mind, we must not forget, that high body weight is a modifiable risk factor, and the already low quality of life in schizophrenic patients can be potentially improved substantially by proper weight management. Despite the caveats noted above, targeting weight reduction is a treatment goal with the potential for both physical and psychological benefits for people with schizophrenia.

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