



## Health-related quality of life and metabolic risk in patients with psychosis



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### ABSTRACT

Improved Health-related quality of life (HRQoL) is an alternative treatment goal for individuals with psychosis, who have up to two times greater prevalence of type 2 diabetes, hypertension and obesity than the general population. Aim: to compare HRQoL in patients with psychosis, especially schizophrenia, with a reference sample and explore the relationship between HRQoL and metabolic risk factors in these patients. Methods: a prospective cohort study was carried out in specialized psychiatric outpatient departments in Sweden. The patients were invited consecutively. A prospective population-based study of public health in the south-east of Sweden served as reference group. Patients were assessed with psychiatric questionnaires that included Global Assessment of Functioning (GAF). Health-related quality of life was assessed using the questionnaire EQ5D, both for patients and the population, and several other health status outcomes were used. Results: At 73%, schizophrenia and schizoaffective disorder were the most common diagnoses in the patient group. The results in patients ( $n = 903$ ) and population ( $n = 7238$ ) showed significant differences in lower EQ5D among patients. According to the definition by the International Diabetes Federation (IDF), elevated blood pressure was the only metabolic risk associated with lower HRQoL in patients. Raised LDL-cholesterol levels were also significantly related to lower HRQoL. Conclusion: patients suffering from psychosis had significantly lower HRQoL regarding all components in EQ5D, except for the pain/discomfort component. Almost half of the patient group met the criteria for metabolic syndrome. According to the IDF criteria, elevated blood pressure was the only metabolic risk factor that had an impact on HRQoL.

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### 1. Introduction

Since most patients with long-term psychotic disorders, including schizophrenia, have a life-long disorder, improved health-related quality of Life (HRQoL) is an important treatment goal (Resnick et al., 2005). HRQoL encompasses several important dimensions including psychological status, functional abilities, personal well-being and physical health (Cramer et al., 2000). A number of factors have been studied in relation to HRQoL in psychiatric patients. Lower everyday functioning, greater severity of symptoms and higher education level have been associated with lower QoL (Skantze, 1998; Ruggeri et al., 2005). Increasing age, however, has been associated with higher HRQoL (Caron et al., 2005).

The generic health-related quality of life assessment instrument EQ5D has been used in population surveys in many countries (Kind et al., 1998; Burstrom et al., 2001), and has also been proved valid in patients with schizophrenia (Bobes et al., 2005; Konig et al., 2007). The EQ5D generates a health profile together with a single index score for HRQoL (Konig et al., 2007) and can detect differences in quality of life among patients with different disease severities (Bobes et al., 2005).

Various diagnostic criteria for metabolic syndrome have been proposed by different organizations over the past few years. The diagnostic criteria according to Alberti et al. (2009) include elevated waist circumference, triglycerides, blood pressure and fasting glucose together with reduced HDL-cholesterol (Alberti et al., 2009). Metabolic risk factors seem to be related to HRQoL. Studies of patients with psychotic disorders describe a strong correlation between obesity and lower subjective HRQoL (Strassnig et al., 2003; Faulkner et al., 2007).

Patients with schizophrenia have a 15–20% shorter life expectancy than the general population (Marder et al., 2004; Crump et al., 2013). The main explanation is linked to the consequences of metabolic risk

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factors and subsequent development of cardiovascular diseases (Laursen et al., 2012; Crump et al., 2013). Individuals with psychosis have up to two times higher prevalence of type 2 diabetes, hypertension and obesity than the general population (Newcomer, 2005; McEvoy et al., 2010).

Previous research shows an association between prevalence of different risk factors for metabolic syndrome and lower HRQoL in patients with depression and anxiety (Roohafza et al., 2012). Both men and women with metabolic syndrome had lower HRQoL compared with controls without the metabolic syndrome in a non-disease specific population study (Frisman and Kristenson, 2009). It is therefore important to study the influence of metabolic risk factors also in patients with psychotic disorders due to the increased risk of influence on HRQoL and the association with high morbidity.

The aim of this study was to compare HRQoL in patients with psychosis, especially schizophrenia, with a reference sample and to analyze the relationship between HRQoL and metabolic risk factors in these patients.

## 2. Methods

### 2.1. Patients

A sample of 903 patients was included. The patients, aged over 18, were consecutively invited to participate in the study when visiting specialized psychiatric outpatient departments for patients with long-term psychotic disorders in the County of Stockholm and six other locations in Sweden between 2005 and 2012. They were diagnosed with schizophrenia or other long-term psychotic disorders (ICD10). Seventy-three percent were diagnosed with schizophrenia or schizoaffective syndrome, 21% with other forms of psychosis, and 6% with bipolar disorder (Table 2).

Patients were assessed regarding level of functioning, using the Global Assessment of functioning (GAF) (American Psychiatric Association, 1994. (DSM-IV), American Psychiatric Press, Washington D.C.), duration of illness and duration of treatment. Patient severity was assessed with the Clinical Global Impression (CGI) scale (National Institute of Mental Health (1970) 12-CGI. Clinical Global Impressions. (In: Guy et al, 1970, Bonato RR (eds) Manual for the ECDEU Assessment Battery, vol 2. Chevy Chase, Maryland, pp 12:11–16)) (Guy et al., 1970).

Somatic health was assessed with an own developed questionnaire about cardiovascular disease, diabetes and hypertension. Data on patients' current medication for these conditions were collected. The questionnaire also included questions on smoking habits and alcohol consumption. We have only presented data on alcohol consumption and smoking habits in this article. Blood pressure was taken in the supine position. Weight was measured with a calibrated weight scale. Body height and weight, as well as waist circumference were measured, and BMI was calculated. Blood samples were drawn with the subjects fasting and subsequently analyzed using routine methods at the Karolinska University Hospital laboratory. The laboratory was accredited according to a quality assurance system (Good Laboratory Practice; GLP).

Health-related quality of life was assessed using the EQ5D questionnaire, a standardized instrument for measuring health status (Dolan, 1997). The EQ5D questionnaire includes five items related to mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Responses in each dimension are divided into three ordinal scales: 1) no problems, 2) moderate problems, and 3) extreme problems. The EQ5D scores were converted into a single summary EQ5D index, which quantifies health status (Brooks, 1996). The index has a range of  $-0.594$ , (lowest HRQoL), to  $1.000$ , (highest HRQoL) and 243 possible health outcomes.

### 2.2. Reference group

A population-based survey sample served as reference group. The survey was conducted in 2006 and included individuals from the

general population aged 18 to 84 years. The survey was stratified with respect to age, gender and community, with a total sample size of 13,440. The reference group was assessed with a self-administrated questionnaire, which included somatic health as well as smoking and alcohol habits. The questionnaire also included self-reported weight, height and EQ5D assessment.

The reference group had a 54% response rate ( $n = 7,238$ ). The response rate was lowest among males aged 18–29 years (32%) and highest among both males and females aged 45–64 years (60%) and 65–89 years (69%).

### 2.3. Statistical analysis

All statistical analyses were performed with SPSS 20.0. The distribution of alcohol consumption was severely skewed with 19.3% consuming no alcohol in the reference sample and 41.2% in the patient group. Thus, comparisons between the groups were performed on stratified data (0 g alcohol per week/non-consumers, 1–199 g/moderate consumers, and > 199 g/high consumers). All variables were summarized with standard descriptive statistics, e.g. mean and frequency. Differences between the reference sample and the patients regarding gender and smoking were analyzed with Pearson's  $\chi$ -test. Differences in age, alcohol consumption and EQ5D index were analyzed with two-way (group \* gender) analysis of variance (ANOVA), since there was a significant difference in the gender distribution (cf. below).

The relationship between HRQoL and BMI was analyzed in a three-way ANOVA (group \* gender \* BMI-group) with age as a covariate, in which the relationship between the separate factors (group, gender and BMI-group) and the EQ5D index appeared as main effects.

The relationship in HRQoL according to the EQ5D index and the metabolic risk factors was analyzed with a logistic regression analysis (stepwise forward with an inclusion criterion of 0.050). In the analysis, the index was dichotomized according to the median (0.80 vs. >0.80) and used as the dependent or "outcome" variable. All variables constituting the metabolic syndrome ([www.idf.org/webdata/docs/MetS\\_def\\_update2006.pdf](http://www.idf.org/webdata/docs/MetS_def_update2006.pdf)), including the metabolic syndrome per se were entered as independent variables together with gender (gender is female), age (>45 years/Md value), smoking (current), high LDL-cholesterol (>3.4 mmol/L or lipid-decreasing medication) and GAF (>50) all of them coded (0 = "No" and 1 = "Yes").

### 2.4. Ethics

The procedures were in accordance with the ethical standards of the local ethic review committee and the Declaration of Helsinki of 1964, revised 2008. The protocol was approved by the Regional Ethics Committee at Linköping University (dnr 2004-447/4, 2008/1629-32) All patients gave their informed consent.

## 3. Results

### 3.1. Demographic and clinical characteristics

There was a significantly higher proportion of men in the patient group compared to the reference sample ( $\chi^2 = 33.32$ ,  $p < 0.001$ ). The mean age of the reference sample was 4 years older than that of the patients, but when split according to gender, the age difference was limited to men ( $M = 52.9$  vs.  $M = 45.1$  for men, and  $M = 49.8$  vs.  $M = 49.1$  for women). The interaction effect was thus highly significant [ $F(1, 8,320) = 35.49$ ,  $p < 0.001$ ]. Demographics are presented in Table 1. Age was entered as a covariate in all of the ANOVAs.

GAF was 61 or below in 80% of the patients. CGI was 4 and over, i.e. moderately or severely ill, in 50% of the patients.

Of the patients, 44.4% of the men and 39.5% of the women were smokers, compared to 18.2 and 20.5%, respectively, in the reference

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