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BRIEF COMMUNICATION

Quality of life and physical activity levels in outpatients with schizophrenia

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Objectives: To assess quality of life (QoL) and physical activity (PA) levels of outpatients with schizophrenia and healthy controls matched for age, gender, body mass index (BMI), hip circumference, waist circumference, and waist-to-hip ratio. Additionally, the present study investigated associations between PA levels, QoL, and anthropometric and behavioral measures among outpatients with schizophrenia.
Methods: Thirty-two outpatients with schizophrenia and 32 individuals without mental illness were included in the study. QoL and PA levels were assessed by the World Health Organization Quality of Life Instrument - Abbreviated version (WHOQOL-Bref) and by GT3X triaxial accelerometers, respectively.
Results: Outpatients with schizophrenia had poorer QoL and lower vigorous PA levels compared with healthy controls ($p < 0.05$). The group with schizophrenia showed a significant association between higher weight and lower scores in the mental health domain of the WHOQOL-Bref. A higher BMI was also significantly associated with lower scores in the physical health domain of the WHOQOL-Bref. Schizophrenic patients with smoking behaviors were associated with fewer steps per day and with less moderate to vigorous PA.
Conclusions: This study seeks to shed some light upon the lifestyle of patients with schizophrenia. New psychosocial approaches should focus on PA, weight, and smoking management, thereby helping these patients to improve their QoL.

Keywords: Quality of life; physical activity; outpatients; schizophrenia

Introduction

Schizophrenia is characterized by a wide spectrum of signs and symptoms, such as delusions and hallucinations, cognitive impairment, and loss of motivation and initiative.[1] Additionally, antipsychotics used for alleviating the symptoms of this disease may produce side effects, including obesity, diabetes mellitus, hypertension, and metabolic syndrome.[2]

Over time, individuals with schizophrenia may experience a decrease in functionality, with negative effects on their ability to perform activities of daily living.[3] In addition, Kurtz & Tolman[4] addressed neurocognitive function limitations associated with attention deficits, working memory, processing speed, verbal learning, reasoning, and problem-solving. Moreover, schizophrenic patients often suffer stigma and discrimination, and show inability to maintain social relationships, as well as impairment of proper social functioning.[5] This scenario makes it difficult for them to self-manage the illness,[6] and, consequently, they tend to have a poorer quality of life (QoL).

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QoL is a subjective experience and has a multidimensional nature.[3] In psychiatric research, QoL has become an important outcome measure for medical care and interventions whose goal is to enhance patient autonomy. Poor QoL among individuals with schizophrenia is associated with many factors, such as demographic (ethnicity, gender, educational level) and clinical variables (hypertension, obesity, metabolic syndrome), pharmacotherapy, pain, duration of untreated illness, and severity of psychopathology.[6,7]

Previous studies have assessed the relationship between physical activity (PA) levels and QoL in individuals with schizophrenia.[8-11] However, all these studies share a common limitation, i.e., the use of subjective measures to assess participants' PA levels. That is why we advocate the use of objective measures that do not rely on information provided by the patient, but instead measure and record PA in real time. To our knowledge, there is no research comparing QoL and objective measures of PA levels between individuals with schizophrenia and the general population.

Therefore, by using accelerometers to assess PA levels and a questionnaire to assess QoL, this study sought to examine the differences in QoL and PA levels between outpatients with schizophrenia and healthy controls matched for age, gender, body mass index (BMI), hip circumference, waist circumference, and waist-to-hip ratio. Additionally, it aimed to analyze the associations between PA levels, QoL,

and anthropometric and behavioral measures among outpatients with schizophrenia.

Methods

Outpatients with schizophrenia (DSM-IV) and individuals without mental illness were enrolled in this study. The individuals with schizophrenia were recruited from three different psychiatric rehabilitation units. Control subjects were matched for age, gender, BMI, waist and hip circumferences, and waist-to-hip ratio; they consisted of employees, university students, and their acquaintances. Neither patients nor healthy controls received any financial incentive to participate in the study. All participants gave their informed consent. The study protocol was approved by the Faculty Ethics Committee.

Height was measured using a Holtain stadiometer (Holtain Ltd., Crymmych, UK), and weight was measured with a Seca scale. Waist circumference was measured at the level of the navel whereas hip circumference was measured at the largest circumference of the hips.

Smoking addiction (smoking regularly for more than 15 years), number of cigarettes per day, and frequency of PA at least three times per week in the last month prior to the study were registered by the researchers.

The Portuguese version of the World Health Organization Quality of Life Instrument - Abbreviated version (WHOQOL-Bref)[12] was applied for QoL assessment. This instrument is a 26-item questionnaire divided into four domains, namely, 1) physical health (e.g., energy and fatigue, mobility, pain and discomfort); 2) psychological health (e.g., positive and negative feelings, thinking, learning, memory and concentration); 3) social relationships (e.g., personal relationships, social support); and 4) environment (e.g., freedom, physical safety and security, health and social care, leisure activities, transport), and also includes two questions about the respondent's general perception of his/her QoL. Each domain consists of three to eight items and each item is assigned a score on a five-point Likert scale. A higher score is associated with a better QoL. An individual interview was conducted during the questionnaire survey.

The GT3X triaxial accelerometer (Actigraph, Florida) was used to objectively measure daily PA. The individuals were instructed to wear an accelerometer, attached to the right hip by an adjustable belt, for 7 consecutive days. This has been a valid instrument for quantifying activity levels both in laboratory and field settings.[13] Accelerometer data were recorded in 5-second sampling periods (epochs) and then aggregated into 60-second epochs for analysis. The standard ActiLife software version 6.9 (Actigraph, Florida) was used to reduce raw data, provided by the accelerometer, to daily PA. Time periods with at least 10 consecutive minutes of zero activity were excluded from the analysis, assuming that the monitor had not been worn. A minimum recording of 8 hours/day was used as the criterion to validate daily PA data. Individuals' data were only included in the analysis if at least 5 days had been successfully assessed.

Descriptive statistics were expressed as mean and standard deviation (SD). The data were tested for normality using the Shapiro-Wilk test. An independent Student *t* test or Mann-Whitney test was used, whenever appropriate, to assess the differences between the schizophrenia group and the matched healthy control subjects. The relationships between variables were calculated using the Spearman's correlation coefficient. All analyses were performed with SPSS version 20.0. Statistical significance was set at $p < 0.05$.

Results

A total of 32 outpatients with schizophrenia (males = 23, females = 9; age = 41.16±6.89; weight = 85.91±15.10; BMI = 29.61±4.68; waist circumference = 104.70±12.99; hip circumference = 107.89±14.83; waist-to-hip ratio = 0.98± 0.13) and 32 individuals without mental illness (males = 22, females = 10; age =38.56±8.70; weight = 78.96±14.17; BMI = 27.66±3.61; waist circumference = 99.29±8.85; hip circumference = 102.68±13.47; waist-to-hip ratio = 0.96± 0.10) were enrolled in the study. Only 25% of the individuals with schizophrenia and 50% of the healthy controls did PA regularly (at least three times a week). Approximately 53% of the patients smoked compared with 15% of the healthy controls. QoL and PA levels of both schizophrenia and healthy control individuals are presented in Table 1.

Table 1 Quality of life and physical activity levels of individuals with schizophrenia and healthy controls

Variables	Schizophrenia	Healthy controls	p-value
WHOQOL-Bref			
Physical domain	59.59±13.44	79.46±13.59	< 0.001
Mental domain	62.41±17.37	81.11±11.88	< 0.001
Social domain	54.03±21.15	83.85±14.81	< 0.001
Environmental domain	59.96±12.46	74.12±13.64	< 0.001
Accelerometer			
Counts per minute during wear time	344.25±108.78	372.32±109.25	0.60
Sedentary PA (min/day)	438.88±48.30	442.92±44.09	0.44
Light PA (min/day)	224.69±68.19	225.81±51.71	0.94
Moderate PA (min/day)	34.58±15.77	36.30±17.39	0.98
Vigorous PA (min/day)	0.23±0.41	2.03±4.63	0.04*
MVPA (min/day)	34.82±15.92	38.33±18.25	0.73
Total steps per day	6,643.92±2,366.88	7,291.51±2,294.75	0.45

Data expressed as mean ± standard deviation.
MVPA = moderate to vigorous physical activity; PA = physical activity.
* $p < 0.05$.

Regarding the associations between QoL, PA levels, and anthropometric and behavioral measures in outpatients with schizophrenia, weight was negatively associated with the mental domain (r = -0.375; p = 0.034). BMI was negatively associated with the physical domain (r = -0.367; p = 0.039). Light PA was negatively associated with the physical (r = -0.436; p = 0.013) and mental (r = -0.472; p = 0. 006) domains. The number of cigarettes smoked per day was negatively associated with counts per minute during wear time (r = -0.574; p = 0.010), moderate PA (r = -0.526; p = 0.021), MVPA (r = -0.512; p = 0.025), and total steps per day (r = -0.530; p = 0.020).

Discussion

This study sought to examine the differences in QoL and PA levels between outpatients with schizophrenia and healthy controls matched for age, gender, BMI, hip and waist circumferences, and waist-to-hip ratio. Our general findings demonstrate that outpatients with schizophrenia have poorer QoL and lower PA levels compared with healthy controls.

Considering QoL assessment, our findings are in line with previous research, in which individuals with schizophrenia were found to have poor QoL.[6,7] Regarding PA levels, we found that individuals with schizophrenia had lower PA levels than did healthy controls. However, significant differences between both groups were only noted in vigorous PA. Our findings are consistent with those of Vancampfort et al.,[14] who observed significantly lower vigorous PA in individuals with schizophrenia compared with healthy controls. These findings are possibly related to the high prevalence of cardiovascular diseases, diabetes, or metabolic syndrome in individuals with schizophrenia.[2] It is known that there is a negative association between metabolic syndrome and vigorous PA levels.[15]

Specifically, in our study, we believe there are three main reasons for these differences. First, all individuals with schizophrenia lived successfully in the community and were referred to psychosocial rehabilitation units. The goal of these units is to help patients to overcome their psychosocial integration difficulties through their participation in daily activities. Therefore, we assume that participation in psychosocial rehabilitation programs may have a positive influence on the PA levels of the schizophrenia group. Second, we are aware that, due to current financial constraints faced by Portugal, individuals with a lower socioeconomic status have lost social benefits. The lack of public transport subsidies may possibly influence the routines and habits of our sample of outpatients, who were probably forced to use walking as a primary mode of transportation. Third, we cannot disregard a selection bias towards healthier control volunteers in our study. Healthy controls consisted of conveniently selected employees, university students, and their acquaintances. A more in-depth evaluation was implemented with a subsample of the schizophrenic outpatients who smoke. This assessment focused on evaluating the relation between smoking rates and PA levels. We found that a higher number of cigarettes smoked per day was associated with fewer total steps per day, counts per minute during wear time, moderate PA, and MVPA. Bobes et al.[16] also argued that individuals with schizophrenia who smoke are less likely to do regular exercise and more likely to have other unhealthy lifestyles.

We also found significant correlations between QoL, weight, and BMI among the participants. Individuals with schizophrenia with higher weight showed a significant association with lower scores in the mental domain, and those with a higher BMI revealed a significant association with lower scores in the physical domain. Similarly, Strassnig et al.[17] reported that excess body weight negatively influenced QoL. Light PA also yielded low scores in the physical and mental domains. Our findings suggest that QoL could be potentially improved with the practice of regular PA, i.e., by reducing inactivity.[17] Likewise, Pesek et al.[9] found that higher PA scores were associated with better QoL in the physical domain.

The findings of this study seek to shed further light upon the lifestyle of patients with schizophrenia and to support the design of effective approaches, thereby improving their QoL. New psychosocial approaches should focus on PA, weight, and smoking management, thus helping these patients to gain a clearer perception of the benefits of PA in their daily lives and allowing them to improve their QoL.

However, these findings should be viewed with caution due to some methodological limitations. This is a cross-sectional study with volunteers and, hence, PA results may have been underestimated. In addition, there was a gender imbalance because of the smaller proportion of female participants. Also, the specific psychopathological symptoms of individuals with schizophrenia were not formally assessed; nor was the mental state of the healthy group. Nonetheless, it is important to mention that all individuals with schizophrenia had been living successfully in the community before participating in this study. Further studies could increase the sample size and conduct a randomized controlled trial, as well as consider the severity of the illness and type of medication used by individuals with schizophrenia.

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Disclosure

The authors report no conflicts of interest.

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