

# Physical activity level and perceived stress in people with schizophrenia monitored in a general psychosocial care center

## Abstract

The objective of this study was to associate the level of physical activity of subjects affected by schizophrenia at CAPS Geral SR I with the level of perceived stress. The research is based on a descriptive model, conducted in the city of Fortaleza, and used a sociodemographic questionnaire developed by the authors, a questionnaire to assess physical activity level, and another to measure perceived stress. The results showed no statistically significant correlations between stress levels and physical activity levels among the study participants. According to Nascimento Junior et al., and Farah et al., regular physical activity can contribute to reducing perceived stress in various populations. Therefore, this study was not able to obtain a positive or negative correlation between physical activity and stress in people with schizophrenia.

**Keywords:** physical activity, stress, schizophrenia, mental health

## Introduction

### Problem identification

According to data from the World Health Organization,<sup>1</sup> approximately one billion people globally are affected by some type of mental disorder, of which 14% are adolescents. WHO data also indicate that suicide accounts for 1 in every 100 deaths globally.

Regarding psychotic disorders, the Pan American Health Organization<sup>2</sup> states that schizophrenia and other psychoses affect around 23 million people worldwide. In 2022, WHO estimated that approximately 1 in every 200 adults suffers from schizophrenia.

Schizophrenia significantly interferes with the quality of life of those affected. It is relevant to examine the study by Sampaio et al.<sup>3</sup> conducted at the Messejana Mental Health Hospital (MMHH), which investigated sociodemographic profiles, nutritional aspects, and cardiometabolic risk factors in individuals with schizophrenia using antipsychotic medication. In a sample of 146 individuals, 25.34% were overweight and 28.08% were obese, based on the Body Mass Index (BMI), suggesting a link to low levels of physical activity and increased risk of cardiovascular complications.

At a national level, BMI data show an increase among adults aged 20 and over: overweight reached 60.0% in men and 63.3% in women, with obesity rates of 22.8% and 30.2%, respectively, in 2019. This highlights the need for special attention to preventing high rates of overweight and obesity.<sup>4</sup>

Freitas et al.<sup>4</sup> conducted a study applying the Quality of Life Scale to 72 individuals with refractory schizophrenia and identified impaired quality of life. The study also indicated that factors such as physical activity, having children, and medium/high family income were associated with better quality of life in this population.

### Problem statement

Although schizophrenia is a medical diagnostic category, this study focuses on understanding the epidemiology of this mental

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suffering and its prevalence in the general population. As a chronic condition, it affects life trajectories, requiring consideration of its impact on quality of life.<sup>5,6</sup>

The concept of quality of life, originally from economics and associated with well-being and development, has evolved to include subjective perception, especially in health. In the 1980s, WHO adopted the concept as multifactorial and culturally contextualized, affecting how people perceive their position in society.<sup>7-9</sup>

In this study, quality of life is understood as the minimum conditions necessary for individuals to develop their full potential in life, emotions, and work.<sup>10</sup> This broader view allows for discussions about the unique clinical aspects of psychosis, and highlights the importance of inter- and transdisciplinary approaches, including physical activity, to promote well-being in people with schizophrenia.

## Justification

Paiva et al.<sup>10</sup> conducted a documentary and quantitative study in a type II Psychosocial Care Center in Fortaleza, Ceará, in 2016. Their analysis of 240 medical records revealed that 37.1% of the patients were diagnosed with schizophrenia, with a balanced distribution between sexes. The high percentage of patients with this condition in that service highlights the need to consider more effective therapeutic strategies, as they represent a significant portion of the target population.

The regular practice of physical activity is seen as a strategic intervention for individuals with schizophrenia. For example, Silva<sup>11</sup> conducted a literature review concluding that programs with varying durations and modalities of training improved cognitive functions in these individuals.

Research that explores this relationship is fundamental to clarifying the link between physical activity and stress, and also to strengthen the evidence supporting cost-effective psychosocial strategies to improve quality of life in this group.

## Objectives

### General objective

To investigate the relationship between physical activity level and perceived stress in patients diagnosed with schizophrenia.

### Specific objectives

To assess physical activity practices of the sample using the International Physical Activity Questionnaire (IPAQ);

To identify the perceived stress levels of the participants using the Perceived Stress Scale (PSS);

To relate the interaction between physical activity and perceived stress levels among the participants.

## Theoretical framework

### Physical activity

According to the World Health Organization (WHO)<sup>12</sup>, physical activity is defined as any voluntary movement produced by skeletal muscles that increases energy expenditure above resting levels. Exercise, in turn, is a planned and structured type of physical activity aimed at promoting beneficial changes in the body, such as improved physical conditioning, aesthetics, and muscle strength.

In a case study by Vieira and Teixeira,<sup>13</sup> it was demonstrated that physiotherapy sessions provided to people with schizophrenia were beneficial in improving motor coordination and balance.

According to the Ministry of Health,<sup>14</sup> physical activity can be performed at different intensities:

Light intensity: effort level of 1–4 on a scale of 0 to 10. These activities require minimal effort, slightly increasing heart and respiratory rate, allowing for conversation.

Moderate intensity: effort level around 5. Heart and respiratory rate increase moderately; speaking is still possible, but singing is not.

Vigorous intensity: effort level  $\geq 7$ . Heart and respiratory rate increase significantly, making it difficult to talk while moving.

According to WHO guidelines, at least 150 to 300 minutes of moderate-to-vigorous aerobic physical activity per week is recommended for adults, including those with chronic illnesses.

A doctoral thesis by Cordeiro et al.<sup>15</sup> showed that physical activity was associated with higher self-esteem in people with schizophrenia, reinforcing its importance in quality of life improvement.

### Stress

One definition of stress comes from Selye,<sup>16</sup> who described it as nonspecific effects that induce changes in the biological system, with multiple manifestations—morphological, biochemical, and functional. These effects are components of the General Adaptation Syndrome (GAS).

According to GAS, stress develops through three stages:

1. Alarm reaction;
2. Resistance;
3. Exhaustion.

Uniform harmful stimuli—such as extreme physical effort, drug use, or prolonged exposure to temperature extremes—can lead to exhaustion and eventually system failure or death.

Selye et al.<sup>17</sup> developed the Perceived Stress Scale (PSS), originally composed of 14 items assessing stressful life situations. It evaluates how unpredictable, uncontrollable, and overwhelming respondents find their lives.

### Mental health and physical activity

Based on PAHO<sup>18</sup> guidelines, the treatment of schizophrenia includes typical (first-generation) and atypical (second-generation) antipsychotics.

According to Alves and Silva,<sup>19</sup> long-term use of antipsychotics may cause extrapyramidal side effects such as drug-induced parkinsonism, akathisia, tardive dyskinesia, and other motor or autonomic dysfunctions.

Melo, Oliveira, and Raposo<sup>20</sup> report that physical activity in mental health treatment brings benefits like hormonal regulation (increased serotonin and endorphins, reduced cortisol), which improve mood, anxiety, stress levels, and even memory.

In a study by Michel,<sup>21</sup> the IPAQ and PSS were applied to patients after a first episode of psychosis. While most patients were physically active (63.1%), the study did not find a significant correlation between activity level and perceived stress, showing the need for further research.

## Methodology

### Type of study

This is a descriptive statistical study, as it is based on collecting, synthesizing, organizing, and describing a set of quantitative and numerical data.<sup>22</sup> The study utilized structured and validated questionnaires to evaluate physical activity levels (short-form IPAQ) and perceived stress (PSS-10).

### Study location

The study was conducted at the General Psychosocial Care Center (CAPS) type II of Regional Secretariat I (SR I) in Fortaleza, Ceará, Brazil. This facility is part of the Psychosocial Care Network (RAPS), regulated by Ordinance No. 3.088.<sup>23</sup>

In the municipality of Fortaleza, the RAPS comprises 118 Primary Health Units (UAPS), 6 general CAPS, 7 CAPS for alcohol and other drugs (AD), 2 CAPS for children, 2 Reception Units (UA), and 2 Therapeutic Residences (RT).

CAPS General type II serves adults (18+) with severe and persistent mental disorders, operating 40 hours per week (8:00 to 17:00), without inpatient beds or night service.

### Population and sample

The study population includes the 363,912 inhabitants of SR I, according to data from the Municipal Health Secretariat of Fortaleza.<sup>24</sup>

The sample targeted residents diagnosed with schizophrenia (ICD-10 codes F20.0 and F20.1), totaling 536 individuals, based on the Fastmedic system accessed by CAPS staff.

The sample size was calculated using OpenEpi 3.01, a public-domain tool developed by the Centers for Disease Control and Prevention (CDC). Using an expected frequency of 5%, 95% confidence level, and 5% margin of error, the required sample was 65 subjects. However, due to refusals, only 24 individuals participated, out of 113 invited.

## Inclusion and exclusion criteria

### Inclusion criteria:

Participants present at CAPS on the day of data collection;

Diagnosed with schizophrenia by a psychiatrist.

### Exclusion criteria:

Illiteracy;

Being in crisis (disorientation, confusion, aggressiveness);

Refusal to participate;

Incomplete response to any questionnaire (IPAQ, PSS, or sociodemographic form).

### Data collection

Data collection occurred from September 1 to December 6, 2023, during CAPS working hours. The questionnaires (sociodemographic, IPAQ, and PSS) were manually completed by participants in a quiet, private room.

Participants were invited verbally by the researcher and, if eligible and accepting, completed the forms in an environment respecting confidentiality and comfort.

**Table 1** Sociodemographic characteristics of study participants

Variables	n (%)	Variables	n (%)
Sex		Marital Status	
Male	17 (70.8%)	Single	20 (83.2%)
Female	7 (29.2%)	Married	2 (8.4%)
Age group		Widowed	0 (0%)
18-29	5 (20.8%)	Divorced	1 (4.2%)
30-49	14 (58.3%)	Common-law marriage	1 (4.2%)
50-69	4 (16.7%)	Personal income	
>70	1 (4.2%)	<1 MW	2 (8.4%)
Diagnosis (ICD)		1 to 3 MW	17 (70.8%)
F20.0	17 (70.8%)	No fixed income	5 (20.8%)
F20.1	2 (8.3%)	Receives BPC	16 (66.7%)
F20.3	1 (4.2%)	Paid employment	
F20.5	2 (8.3%)	Formal	0 (0%)
F20.8	1 (4.2%)	Informal	3 (12.5%)
F20.9	1 (4.2%)	Not applicable	21 (87.5%)
Education			
Incomplete Elem.	9 (37.5%)		
Complete Elem.	4 (16.6%)		
Incomplete HS	0 (0%)		
Complete HS	10 (41.7%)		
Higher Education	1 (4.2%)		

**Table 2** IPAQ Classification by gender

IPAQ Classification	Female	Male	Total
Active	6	14	20
Sedentary	1	0	1
Irregularly Active A	0	1	1
Irregularly Active B	0	1	1
Very Active	0	1	1
Total	7	17	24

**Table 3** PSS Scores by gender

PSS Score	Female	Male
4		1
6	1	
8		2
10		1
13		1
14	2	1
16		1
17		1
19	1	1
20	3	1
21		1
22		1
24		1
26		1
29		1
30		2

### Ethical aspects

The study posed minimal risk to participants. Participation was voluntary and free of charge. Potential discomfort could arise due to the personal nature of the questions.

All CAPS staff were informed about the study. No adverse incidents were reported. Participants received feedback on their results and were advised on WHO physical activity guidelines.<sup>12</sup>

## Results

### Group description

The data collected were organized using a Sociodemographic Questionnaire. Among the 24 participants:

17 were male (70.8%)

7 were female (29.2%)

Age distribution:

18–29 years: 5 participants (20.8%)

30–49 years: 14 participants (58.3%)

50–69 years: 4 participants (16.7%)

Over 70 years: 1 participant (4.2%)

Diagnosis (ICD-10):

F20.0 (Paranoid Schizophrenia): 17 participants (70.8%)

F20.1 and F20.5: 2 each (8.3%)

F20.3, F20.8, F20.9: 1 each (4.2%)

Education level:

Incomplete Elementary School: 9 (37.5%)

Complete Elementary School: 4 (16.6%)

Complete High School: 10 (41.7%)

Higher Education: 1 (4.2%)

Income and employment:

Most received up to 1–3 minimum wages

66.7% received BPC (a Brazilian social benefit)

Only 3 (12.5%) worked in informal jobs; none were formally employed

IPAQ Data Description

### According to IPAQ results:

#### Among female participants:

6 were classified as active

1 was sedentary

#### Among male participants:

14 were active

1 was irregularly active A

1 was irregularly active B

1 was very active

This shows a high prevalence of physical activity, especially among male participants.

### PSS data description

Based on PSS scores:

Female participants:

3 scored 20 points

2 scored 14

1 scored 6

1 scored 19

Male participants:

Scores ranged from 4 to 30, with several above the normative threshold ( $\geq 17$  for males,  $\geq 19$  for females)

According to **Reis and Petroski**,<sup>26</sup> these scores indicate that a number of participants had elevated levels of perceived stress.

### IPAQ and PSS correlation

While the majority of the group was classified as physically active, many also presented significant levels of perceived stress. This suggests that physical activity alone may not be sufficient to reduce stress in this population.

## Discussion

The findings of this study did not demonstrate a statistically significant relationship between physical activity and perceived stress. The study by OLIVEIRA<sup>27</sup> highlighted the improvement in quality of life among individuals with schizophrenia engaged in physical exercise but did not measure stress specifically. Similarly, PULCINELLI<sup>28</sup> found a reduction in depression after 12 weeks of physical activity, though the results were not statistically significant.

The literature suggests that low levels of physical activity may be associated with higher levels of stress, as emphasized by NASCIMENTO JUNIOR, CAPELARI AND VIEIRA<sup>29</sup> and FARAH ET AL.<sup>30</sup> However, the sample size in this research may have limited the ability to detect a significant correlation.

The regular practice of physical activity contributes to improved physiological functioning, better sleep quality, and minimization of medication side effects, as suggested by ASSUNÇÃO & ASSUNÇÃO.<sup>31</sup> Nonetheless, broader and more robust studies are necessary to deepen our understanding of this relationship and reinforce the relevance of physical activity in therapeutic interventions for schizophrenia.

## Final considerations

Due to the limited number of participants, the present study was unable to confirm a statistically significant correlation between the level of physical activity and perceived stress among individuals diagnosed with schizophrenia. Although most participants were classified as active, many displayed elevated stress scores.

These results do not invalidate the positive effects of physical activity demonstrated in the literature, but they reinforce the need for larger-scale studies that could clarify this relationship with more robust statistical support. Understanding how physical activity interacts with perceived stress is essential to planning interdisciplinary and transdisciplinary strategies aimed at improving the quality of life and health promotion of people living with schizophrenia.

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## Conflicts of interest

The authors declare that there are no conflicts of interest.

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