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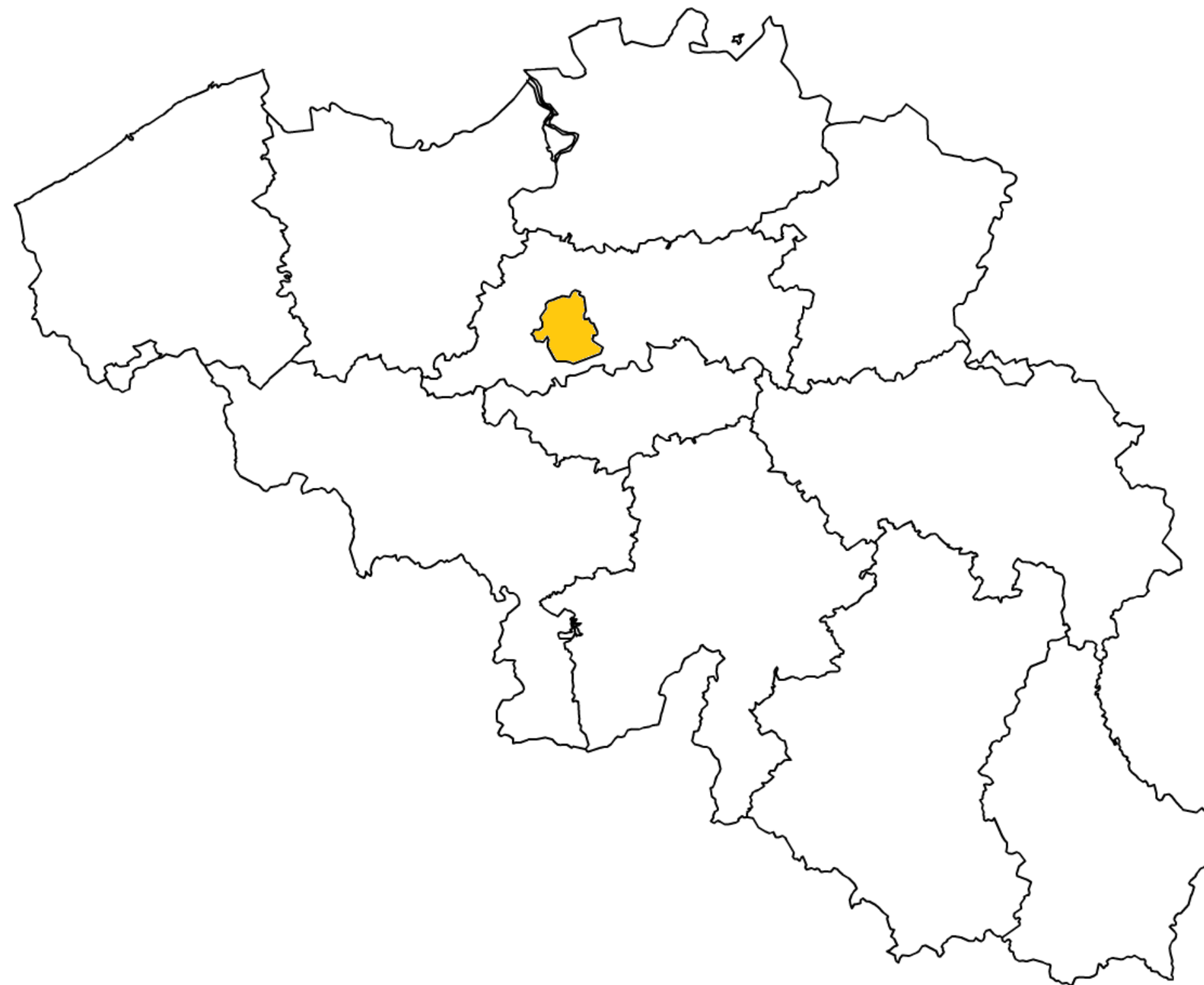


PSYCHOSIS AND PHYSICAL ACTIVITY

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The story of Nordin

Nordin is 22 years old. He lives with his parents in Brussels. He does not work.

He dropped out of school at a very young age. His parents tried to get him to see a shrink, but to no avail...

Nordin started using cannabis at the age of 16. He quickly became addicted, taking it several times a day and needing it to fall asleep.

Over the last few months, his sleep problems have worsened. He lives "out of sync", falling asleep around 6am and waking up in the afternoon. He isolates himself more and more. He gave up all his sporting activities, overindulged in fatty foods and gained 11 kg. His friends found him increasingly strange. One evening, in front of his parents, he made an interpretative speech, focusing on his neighbours who wanted to harm him.

Two weeks after these worrying remarks, he physically attacked his neighbour. The police were called. In view of his mental state, he was taken to an emergency room, which suggested that he is hospitalised under constraint. He arrived at the psychiatric hospital the next morning.

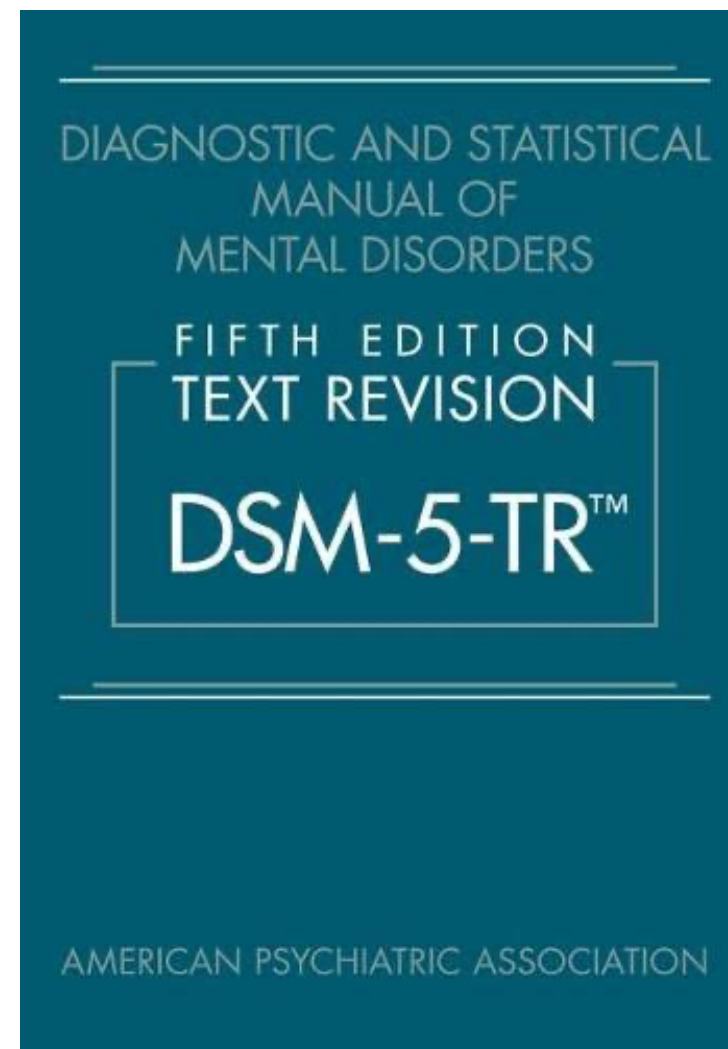
OUR NEW SPORTS HALL!



My hospital has a magnificent sports hall.

But

- **Caregivers don't use it as a therapeutic space.**
- **Patients are not motivated to use the gym.**



Schizophrenia spectrum and other psychotic disorders

What is psychosis?



What is psychosis?



Psychosis is a mental health condition characterized by a disconnection from reality, which can manifest in a variety of ways. It often involves a combination of symptoms that affect a person's thoughts, emotions, perceptions, and behaviors.

What is psychosis?



Psychosis is a disturbance in the way we relate to ourselves, to others and to the world

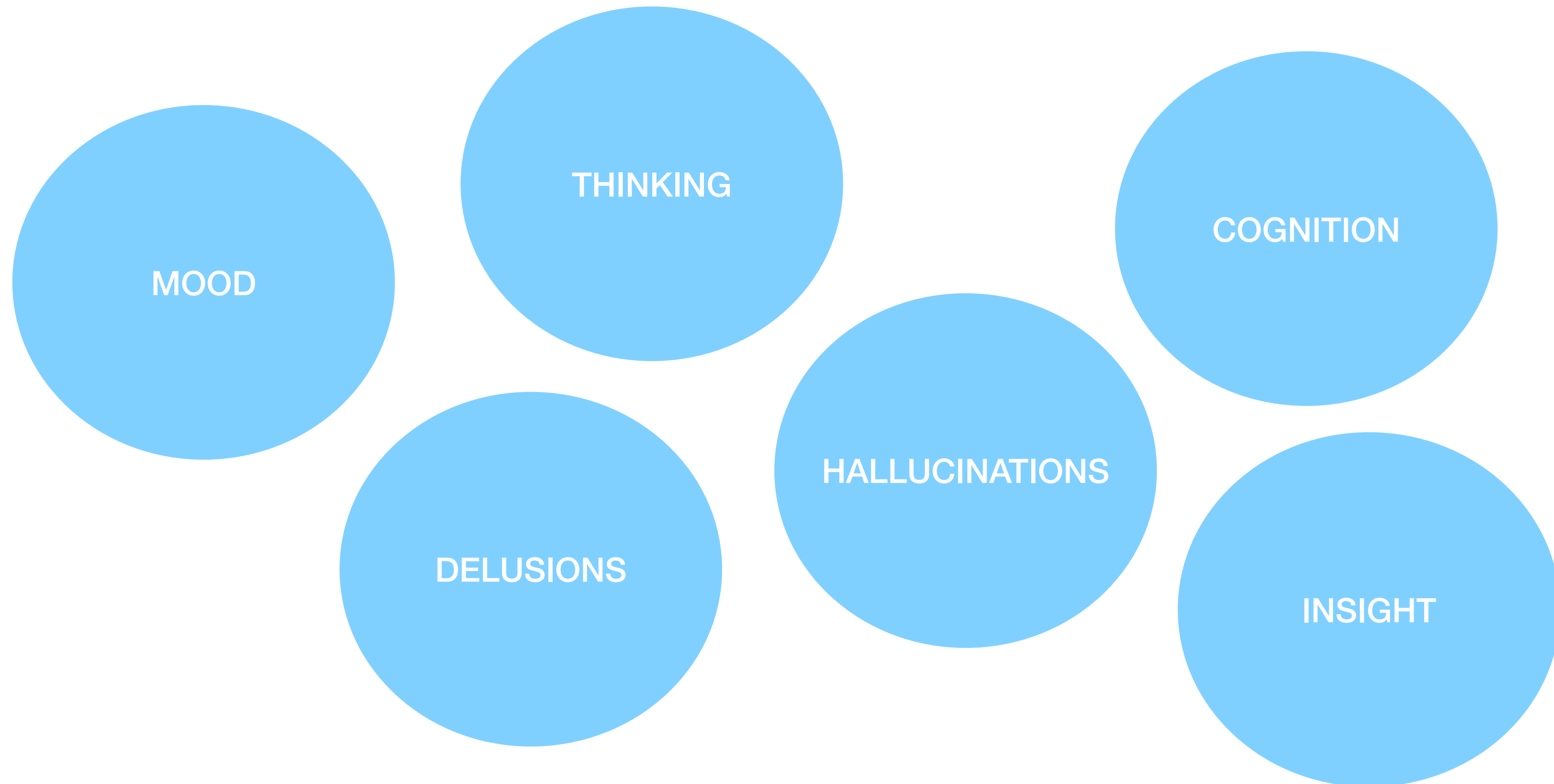
Schizophrenia spectrum and other psychotic disorders

- Although we tend to discuss schizophrenia as if it is a single disease, it likely comprises a group of disorders with heterogeneous etiologies, which includes patients whose clinical presentations, treatment response, and courses of illness vary.
- Signs and symptoms are **variable** and include changes in **perception, emotion, cognition, thinking, and behavior.**
- The expression of these symptoms varies across patients and over time, but **the effect of the illness is always severe and is usually long-lasting.**
- The disorder usually begins before age 25 years, persists throughout life, and affects persons of all social classes.
- Both patients and their families often suffer from inadequate care and social ostracism because of widespread ignorance about the disorder.

Schizophrenia spectrum and other psychotic disorders

- Patients with a diagnosis of schizophrenia account for **15 to 45 percent of homeless Americans**, and about 5% of patients with schizophrenia per year are homeless.
- Worldwide, **schizophrenia is one of the top 25 leading causes of disability**.
- However, this disorder affects not only individuals but families, caregivers, and societies overall. For this reason, **indirect costs are enormous and often underestimated**.

Schizophrenia spectrum and other psychotic disorders



Schizophrenia spectrum and other psychotic disorders: MOOD

- Two common affective symptoms in schizophrenia are **reduced emotional responsiveness**, sometimes severe enough to warrant the label of anhedonia, and **overly active and inappropriate emotions** such as extremes of rage, happiness, and anxiety.
- A flat or blunted affect can be a symptom of the illness itself, of the parkinsonian adverse effects of antipsychotic medications, or depression, and **differentiating these symptoms can be a clinical challenge.**



Schizophrenia spectrum and other psychotic disorders: THINKING

- **Psychotic disorders are, first and foremost, thought disorders** and the disorder may affect either the process or content of their thought or both. A schizophrenia patient's thoughts may be challenging to understand and elicit. However, this is essential, as thought symptoms may represent the core symptoms of schizophrenia.
- **Disorders of thought concern the way we formulate ideas and languages.** We sometimes call these formal thought disorders.
- When **mild**, thought disorders might present as stilted or vague. **As it worsens**, associations become looser. The patient may display circumstantiality, tangential thinking, perseverative thinking, neologisms, echolalia, verbigeration, word salad, and mutism.

Schizophrenia spectrum and other psychotic disorders: DELUSIONS

- **Delusions, the most obvious example of a disorder of thought content, are varied in schizophrenia and may assume persecutory, grandiose, religious, or somatic forms.**
- Patients may believe that an outside entity controls their thoughts or behavior or, conversely, that they extraordinarily control outside events (such as causing the sun to rise).
- Patients may have an intense and consuming preoccupation with esoteric, abstract, symbolic, psychological, or philosophic ideas.
- Patients may also worry about allegedly life-threatening but bizarre and implausible somatic conditions, such as the presence of aliens inside the patient's testicles affecting his ability to father children.



Schizophrenia spectrum and other psychotic disorders: HALLUCINATIONS

- Any of the five senses may be affected by hallucinatory experiences in patients with schizophrenia. **The most common hallucinations, however, are auditory**, with voices that are often threatening, obscene, accusatory, or insulting. Two or more voices may converse among themselves, or a voice may comment on the patient's life or behavior.
- **Visual hallucinations are common**, but tactile, olfactory, and gustatory hallucinations are unusual; their presence should prompt the clinician to consider the possibility of an underlying medical or neurologic disorder that is causing the entire syndrome.



Schizophrenia spectrum and other psychotic disorders: COGNITION

- Patients with schizophrenia are usually oriented to person, time, and place.
- **Memory, as tested in the mental status examination, is usually intact**, but there can be minor cognitive deficiencies.
- A significant development in the understanding of the psychopathology of schizophrenia is the appreciation of **subtle cognitive impairment. In outpatients, cognitive impairment is a better predictor of the level of function than is the severity of psychotic symptoms.** Patients with schizophrenia typically exhibit subtle cognitive dysfunction in the domains of attention, executive function, working memory, and episodic memory.

Schizophrenia spectrum and other psychotic disorders: INSIGHT

- Classically, patients with schizophrenia have poor insight into the nature and severity of their disorder. The so-called lack of insight is associated with poor compliance with treatment.
- A patient with schizophrenia is no less reliable than any other psychiatric patient. The nature of the disorder, however, requires the examiner to verify relevant information through additional sources.

Schizophrenia spectrum and other psychotic disorders: SAFETY CONCERNS

- Violent behavior (excluding homicide) is common among untreated schizophrenia patients, and **the increased odds of a patient with schizophrenia committing acts of violence, compared to the general population, is 49% to 68%.**
- Suicide attempts are made by 20 to 50 percent of the patients, with long-term rates of suicide estimated to be 10 to 13 percent.

Schizophrenia spectrum and other psychotic disorders

- We can divide the symptoms of schizophrenia into three groups: **positive, negative and cognitive**.
- **Positive symptoms are abnormal behaviours.** These are the symptoms frequently associated with an acute psychotic episode and are mainly disorders of thought and presentation. They include hallucinations, delusions and other bizarre behaviour.
- **Negative symptoms are the absence of normal behaviour.** Negative symptoms are defined by their absence and are sometimes also called deficit symptoms. They include absence of affect, absence of thought, absence of motivation, absence of pleasure and absence of attention.
- **Cognitive symptoms are impairments of normal cognitive functions.** The cognitive symptoms of schizophrenia may be subtle, particularly at the start of the disease process, but they are highly significant and account for much of the disability associated with the disorder. They include impairments in attention, working memory and executive functions.

Impact of psychosis on physical activity and motivation to exercise

Impact of psychosis on physical activity and motivation to exercise

- **Reduced Motivation:** Negative symptoms impact motivation: lack of interest and difficulties initiating and sustaining exercise routine.
- **Medication side effects:** Antipsychotics have side effects, such as weight gain, sedation and muscle stiffness.
- **Cognitive impairment:** hinders a person's ability to plan and participate in physical activities effectively.
- **Social isolation:** limit opportunities for engaging in physical activities that often involve social interaction, such as team sports.
- **Lack of Insight:** Individuals may not recognize the benefits of exercise or the need to prioritize it.
- **Stigma and Discrimination:** Fear of judgment or negative reactions from others.
- **Disrupted Daily Routine:** struggle to maintain consistent sleep patterns, which can further affect energy levels and motivation.

RESEARCH REPORT

Sedentary behavior and physical activity levels in people with schizophrenia, bipolar disorder and major depressive disorder: a global systematic review and meta-analysis

Davy Vancampfort^{1,2}, Joseph Firth^{3,4}, Felipe B. Schuch⁵⁻⁷, Simon Rosenbaum^{8,9}, James Mugisha^{10,11}, Mats Hallgren¹², Michel Probst¹, Philip B. Ward^{8,13}, Fiona Gaughran¹⁴, Marc De Hert², André F. Carvalho¹⁵, Brendon Stubbs^{16,17}

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People with severe mental illness (schizophrenia, bipolar disorder or major depressive disorder) die up to 15 years prematurely due to chronic somatic comorbidities. Sedentary behavior and low physical activity are independent yet modifiable risk factors for cardiovascular disease and premature mortality in these people. A comprehensive meta-analysis exploring these risk factors is lacking in this vulnerable population. We conducted a meta-analysis investigating sedentary behavior and physical activity levels and their correlates in people with severe mental illness. Major electronic databases were searched from inception up to April 2017 for articles measuring sedentary behavior and/or physical activity with a self-report questionnaire or an objective measure (e.g., accelerometer). Random effects meta-analyses and meta-regression analyses were conducted. Sixty-nine studies were included (N=35,682; 39.5% male; mean age 43.0 years). People with severe mental illness spent on average 476.0 min per day (95% CI: 407.3-545.4) being sedentary during waking hours, and were significantly more sedentary than age- and gender-matched healthy controls (p=0.003). Their mean amount of moderate or vigorous physical activity was 38.4 min per day (95% CI: 32.0-44.8), being significantly lower than that of healthy controls (p=0.002 for moderate activity, p<0.001 for vigorous activity). People with severe mental illness were significantly less likely than matched healthy controls to meet physical activity guidelines (odds ratio = 1.5; 95% CI: 1.1-2.0, p<0.001, I²=95.8). Lower physical activity levels and non-compliance with physical activity guidelines were associated with male gender, being single, unemployment, fewer years of education, higher body mass index, longer illness duration, antidepressant and antipsychotic medication use, lower cardiorespiratory fitness and a diagnosis of schizophrenia. People with bipolar disorder were the most physically active, yet spent most time being sedentary. Geographical differences were detected, and inpatients were more active than outpatients and those living in the community. Given the established health benefits of physical activity and its low levels in people with severe mental illness, future interventions specifically targeting the prevention of physical inactivity and sedentary behavior are warranted in this population.

Key words: Physical activity, sedentary behavior, severe mental illness, schizophrenia, bipolar disorder, major depressive disorder, physical activity guidelines, cardiovascular disease, premature mortality

(*World Psychiatry* 2017;16:308–315)

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Key words: Physical activity, sedentary behavior, severe mental illness, schizophrenia, bipolar disorder, major depressive disorder, physical activity guidelines, cardiovascular disease, premature mortality

(World Psychiatry 2017;16:308-315)

- People with severe mental illness were **sedentary for 476.0 min (95% CI: 407.3-545.4) per day during waking hours → 8 hours**
- **People with schizophrenia are the least physically active.**
- The mean amount of **moderate or vigorous physical activity** in people with severe mental illness was **38.4 min per day (95% CI: 32.0-44.8)**.
- **People with severe mental illness engaged in less moderate physical activity and vigorous physical activity** than healthy controls.
- Significant differences in moderate or vigorous physical activity levels were observed according to the treatment setting where patients were assessed. **Inpatients (90.1 min per day, 95% CI: 72.7-107.5) were more physically active than outpatients (32.5 min per day, 95% CI:25.6-39.5)**, whilst **community patients were the least active (16.0 min per day, 95% CI: 9.5-22.5)**.

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- **Approximately half of people with severe mental illness do not meet the recommendation of at least 150 min of moderate physical activity per week.**
- **Higher body mass index, lower cardiorespiratory fitness, and antidepressant or antipsychotic prescription** might constitute barriers for engaging in physical activity
- The higher levels of moderate or vigorous physical activity in inpatients suggest that **there is increasing interest in aerobic exercise** as a valuable treatment modality in psychiatric centres.

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« Addressing these modifiable risk factors for premature mortality through the implementation of evidence-based sedentary behavior reduction and physical activity promotion interventions is an international imperative ».

Physical activity as a potential adjunct therapy in psychosis

Physical activity as a potential adjunct therapy in psychosis

- **The role of regular physical activity and exercise participation** on reducing the risk for premature all-cause mortality and diverse chronic medical conditions (such as cardiometabolic disease and hypertension) **is well established** (Warburton and Breeding, 2017).
- Regular physical activity and/or exercise participation can improve **quality of life, increase functional capacity, improve cardiorespiratory fitness, and increase muscular strength** in persons living with major mental illness (Silva et al, 2015, Heggelund et al, 2011, Marzolini et al, 2009).

PA and antipsychotic medication

- Regular exercise and physical activity participation may also help to **counteract some of the side effects associated with antipsychotic medications.**
- The engagement in physical activity/exercise can be advantageous in **alleviating negative symptoms and lead to a reduction in dosage of antipsychotic medications.**



Review

A systematic review of correlates of physical activity in patients with schizophrenia

D. Vancampfort, J. Knapen, M. Probst, T. Scheewe, S. Remans, M. De Hert

First published: 19 December 2011 | <https://doi.org/10.1111/j.1600-0447.2011.01814.x> | Citations: 225

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Effects of Aerobic, Resistance, and Combined Exercise Training on Psychiatric Symptom Severity and Related Health Measures in Adults Living With Schizophrenia: A Systematic Review and Meta-Analysis

OPEN ACCESS

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Aerobic Exercise

Resistance Exercise

Nature of Exercise Involves continuous, rhythmic movements that engage larger muscle groups over an extended period, focusing on increasing heart rate and oxygen intake. Examples include running, swimming, cycling, and dancing.

Involves resistance against muscle contraction, often using weights, machines, bands, or body weight, to target specific muscles and promote strength and muscle development.

Goals Mainly aimed at improving cardiovascular health, endurance, and respiratory capacity. It helps burn calories, improve blood circulation, reduce the risk of heart disease, and enhance overall stamina.

Primarily aimed at increasing muscle strength, muscle mass, bone density, and stability. It targets muscle growth and development.

Intensity Typically moderate to high intensity, sustained over a longer duration to elevate and maintain heart rate.

Higher intensity per repetition but shorter sets followed by rest periods. Focuses on controlled movements and increasing resistance over time to stimulate muscle growth.

Calorie burning Burns calories both during and after exercise due to an elevated metabolism.

Burns calories during exercise but typically less than aerobic exercise. However, it can boost metabolism over time as muscles develop.

The measure of efficacy of exercise: PANSS

- The PANSS, or Positive and Negative Syndrome Scale, is a standardized assessment tool widely used in the field of psychiatry to **measure the severity of symptoms in individuals with schizophrenia.**
- The PANSS consists of 30 individual items or symptoms, which are divided into three main categories:
 - Positive Symptoms
 - Negative Symptoms
 - General Psychopathology: includes items related to anxiety, depression, guilt feelings, and unusual thoughts.
- The PANSS is commonly used in clinical and research settings **to assess the effectiveness of treatments, track changes in symptom severity over time, and make diagnostic evaluations.**
- The PANSS is a specifically clinical tool, aimed at strictly clinical assessment. **Dimensions of well-being and quality of life are not measured by the PANSS.**

Effect of aerobic exercise

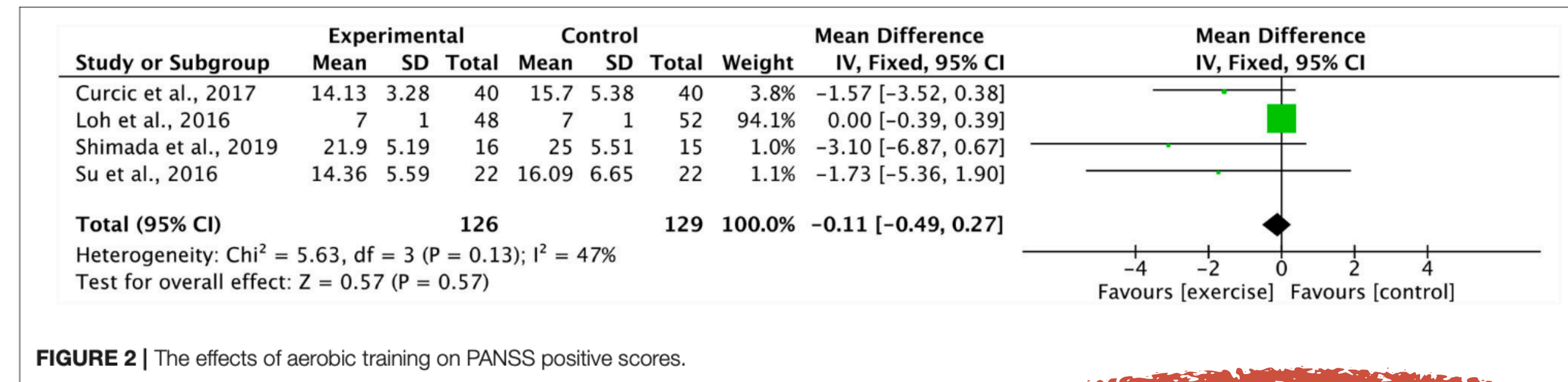


FIGURE 2 | The effects of aerobic training on PANSS positive scores.

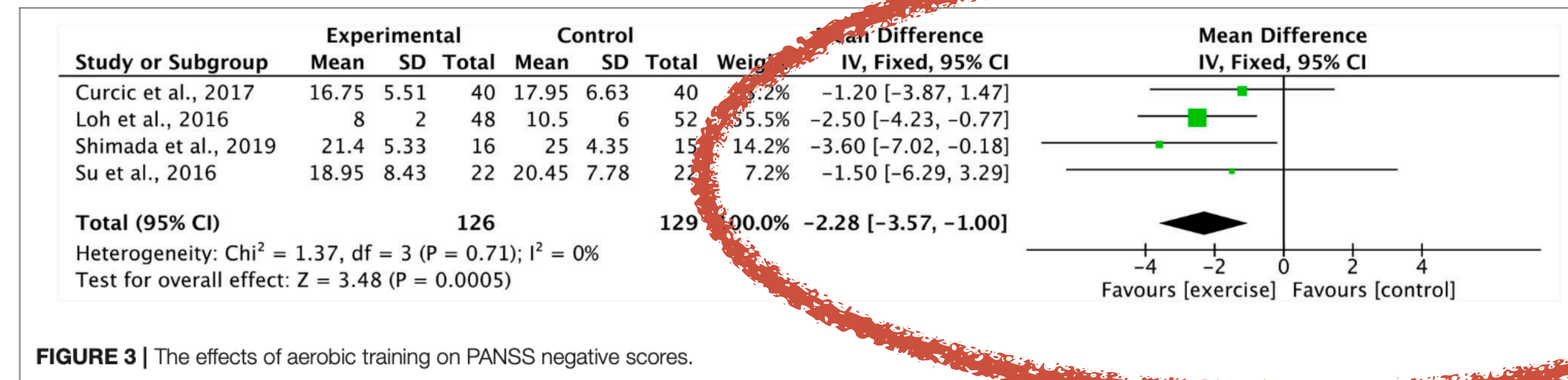


FIGURE 3 | The effects of aerobic training on PANSS negative scores.

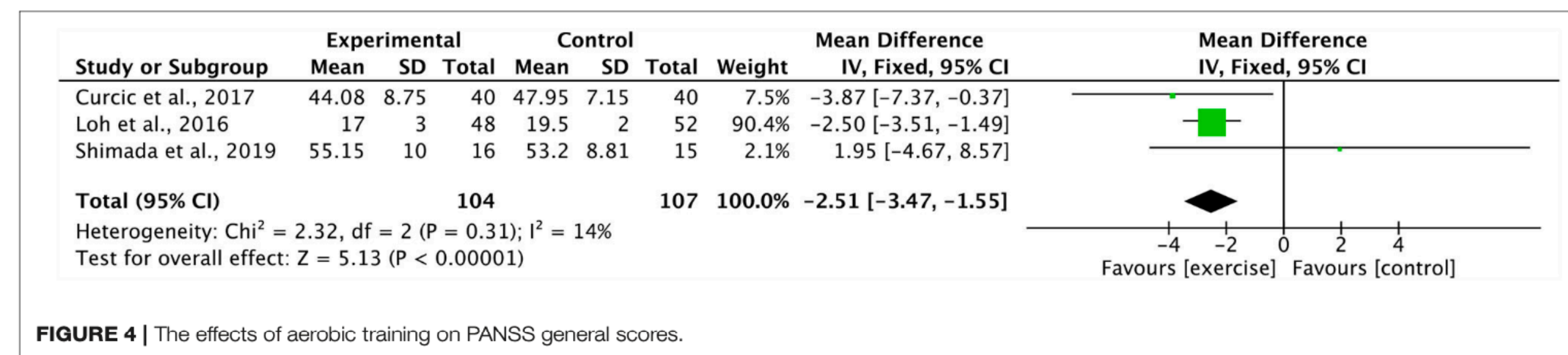


FIGURE 4 | The effects of aerobic training on PANSS general scores.

Effect of combined exercise

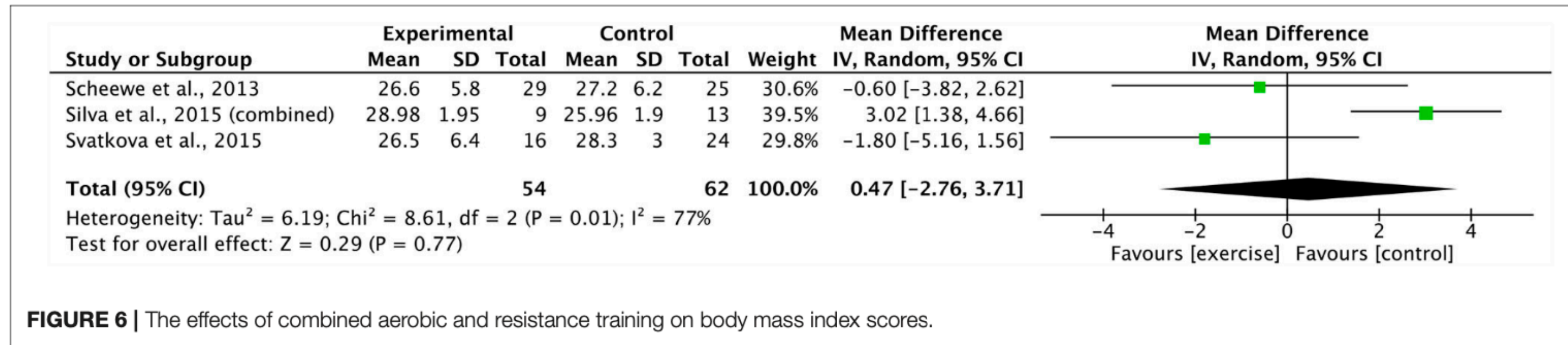


FIGURE 6 | The effects of combined aerobic and resistance training on body mass index scores.

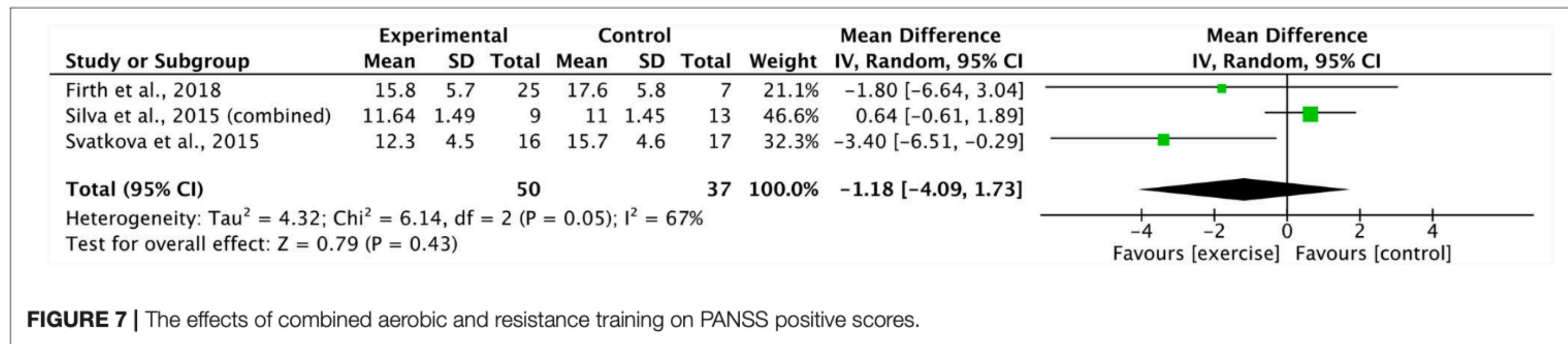


FIGURE 7 | The effects of combined aerobic and resistance training on PANSS positive scores.

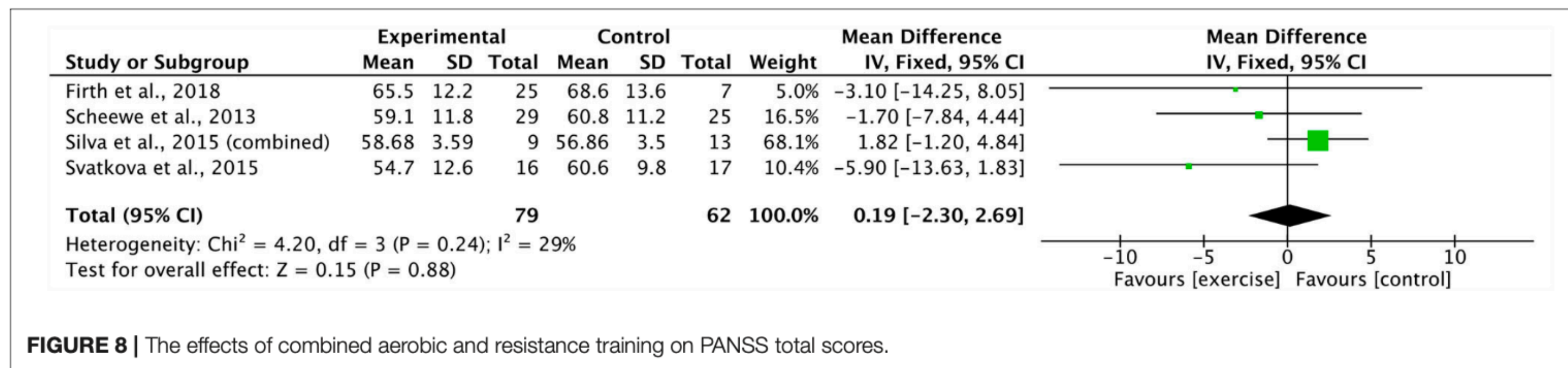


FIGURE 8 | The effects of combined aerobic and resistance training on PANSS total scores.

AEROBIC EXERCISE

- **Walking has been identified as a preferred method** of treatment in individuals living with schizophrenia due to high accessibility and increased levels of motivation
- According to Kim and Jean (2020), a duration of 30–40 min, three days per week, over 10–12 weeks resulted in increased health benefits.
 - **This dosage is well below international physical activity guideline recommendations for apparently healthy individuals**, but consistent with other clinical populations that have exhibited low aerobic capacities and high levels of physical inactivity and sedentary behavior.

RESISTANCE EXERCISE

- Paucity of data in psychosis.
- However, **resistance training reduces all-cause mortality** by increasing musculoskeletal fitness and functional independence in the general population.
- Therefore, considering the **increased risk of secondary complications** (such as cardiometabolic disease) and **premature mortality**, further investigation is warranted to fully examine the effects of resistance training on psychiatric symptoms and health outcomes in schizophrenia.
- Preliminary evidence supporting **two-to-three sessions of resistance training carried out over a period of 12 weeks or more** (Schwaab et al, 2021).

COMBINED AEROBIC AND RESISTANCE TRAINING

- **Improvements in psychiatric symptoms** (PANSS positive, negative, and total scores) that were only detected **through the implementation of programs that included aerobic training.**
- However, **preliminary evidence to support the efficacy of combined training** on psychiatric symptoms.

Article

Exercise Predicts a Good Night's Sleep: Preliminary Findings from a UCLA Study of First-Episode Schizophrenia

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SLEEP

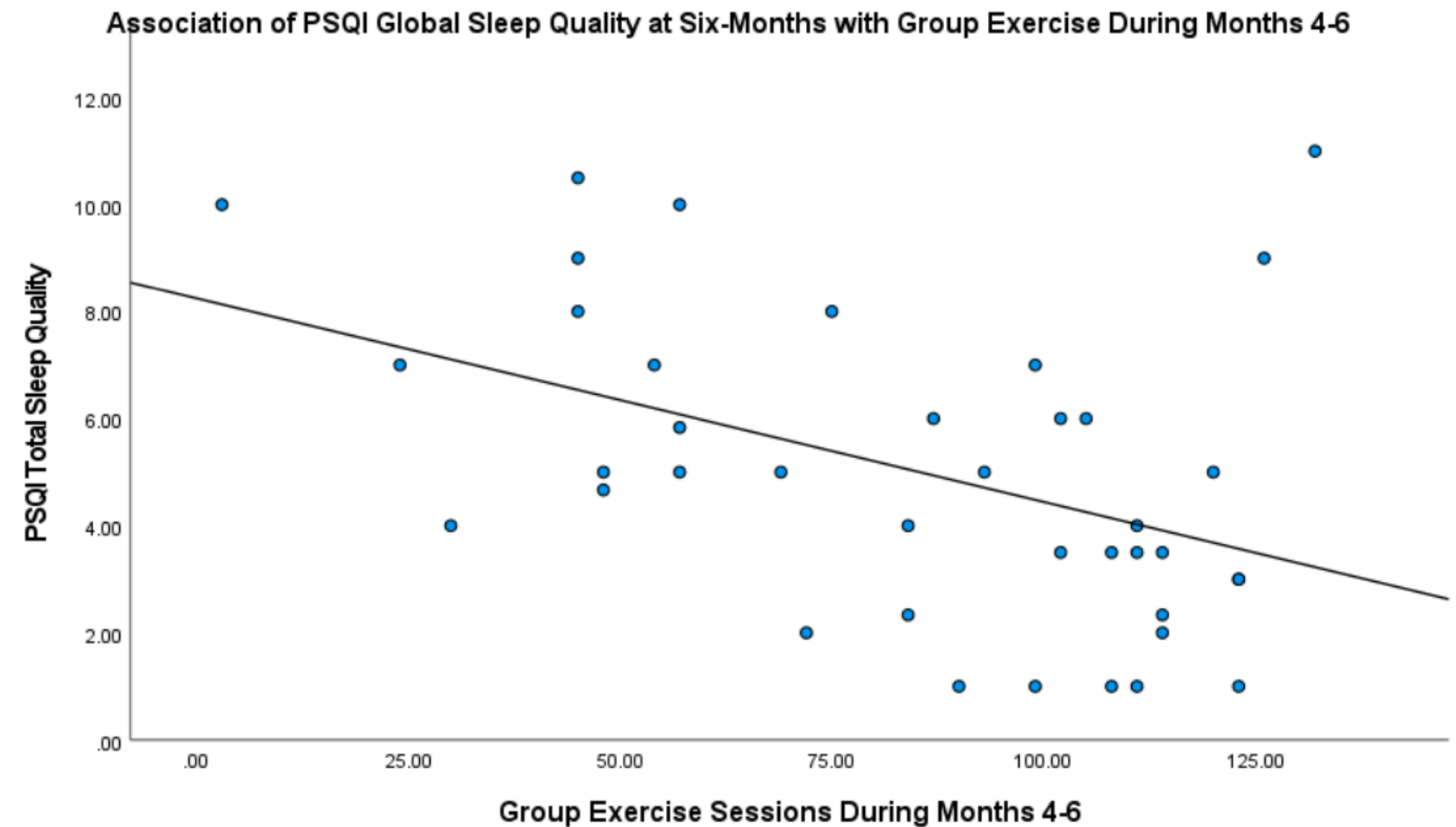


Figure 1. Association of PSQI Global Sleep Quality at Six Months with Group Exercise During Months Four through Six.

NEUROBIOLOGICAL ASPECTS

- Patients with schizophrenia have also been found to have decreased serum levels of BDNF. **Resistance and aerobic exercise induced increased serum levels of BDNF as well as improved neurocognitive functioning** in patients with schizophrenia after 12 weeks of an exercise program (Kim, 2014).
- Pajonk et al. (2010) showed that 3 months of aerobic exercise (moderate-intensity cycling) **increased hippocampal volume by 12% compared to no improvement in the non-exercise group resulting in improvements in short-term memory** (Girdler et al., 2019).

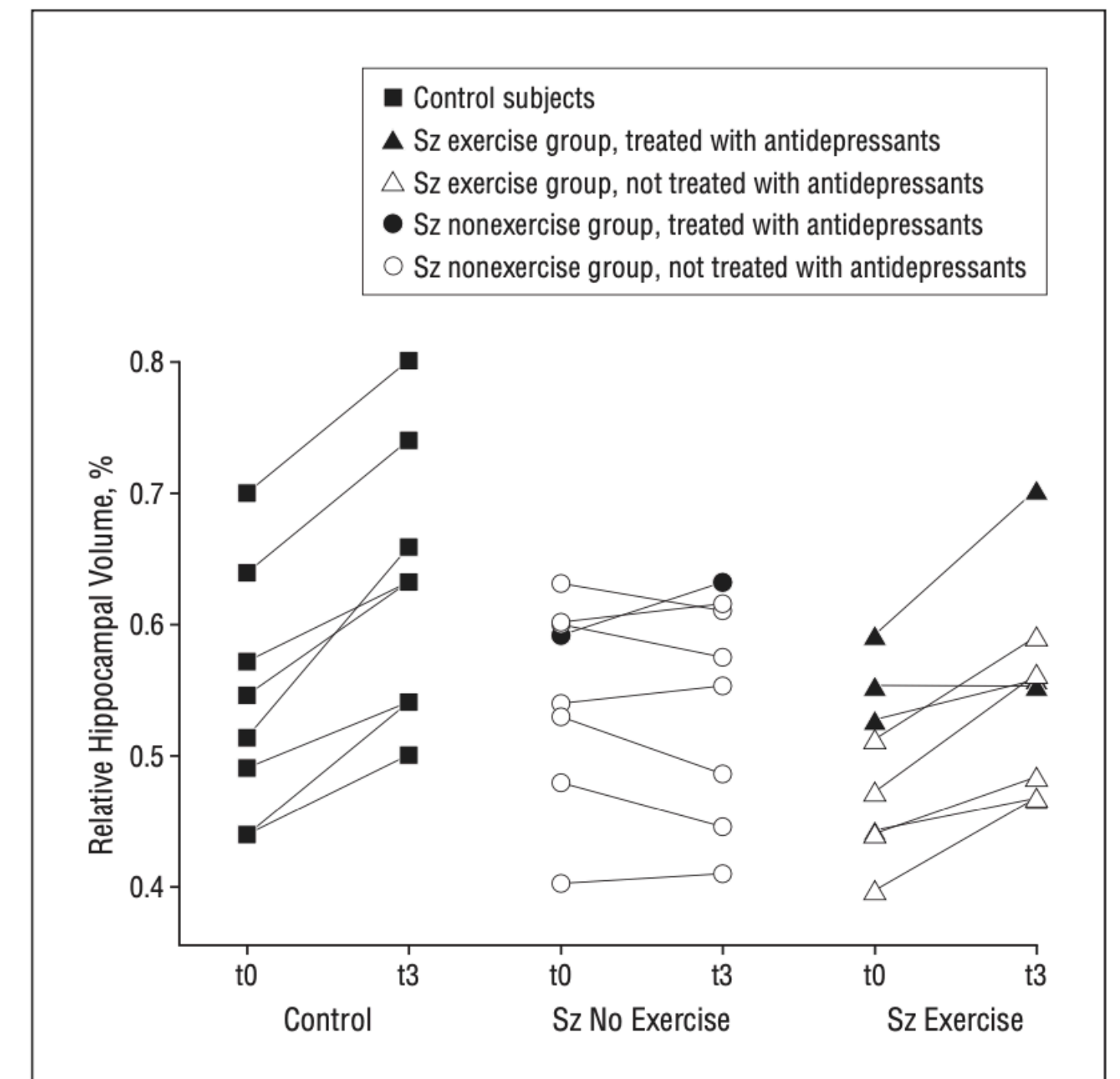


Figure 2. The changes in hippocampal volume in control subjects, schizophrenic (Sz) patients participating in aerobic exercise, and Sz patients with no aerobic exercise intervention. The data points present the relative hippocampal volume of each subject as a percentage of the total brain volume at baseline (t0) and 3 months later at end point (t3).

The story of Nordin

Nordin is hospitalised in our crisis unit.

He is isolated, delirious and hallucinating, but has not lost his capacity for discernment.

Based on scientific evidence, physical activity should be part of his interdisciplinary care plan.

To achieve this, the carers need to be convinced of the benefits of physical activity from Day 1.

And Nordin needs to be motivated, but not forced.

BEYOND PURELY SYMPTOMATIC IMPROVEMENT

- Caregivers cannot be satisfied with symptomatic improvement alone.
- **Personal recovery** is essential in psychiatry.
- All patients must be able to understand how they function so that they can adapt to the world around them and enjoy a quality of life that suits them.
- **The modern notion of recovery implies empowerment, hope and availability.**
- **The role of caregivers is to support people in their recovery process.**
- **Physical activity is a tool for achieving this!**

BEYOND PURELY SYMPTOMATIC IMPROVEMENT: THE PSYCHOSOCIAL APPROACH

- Aims to acquire mental and physical skills related to the body in movement and to support personal development in order to **improve people's ability to function independently in society.**
- **This approach is part of psychosocial rehabilitation and respects the principles of recovery.**
- Thanks to these effects, it is possible to halt the downward spiral that leads, for example, to depression.
- **Regular, well-balanced endurance activities (walking, cycling, jogging and swimming), strength training (fitness) and exercises derived from mindfulness improve sleep quality, boost self-confidence, energy, stamina and relaxation, and generally reduce physical complaints.**

PA AND QUALITY OF LIFE IN SCHIZOPHRENIA

TBM

SYSTEMATIC REVIEWS

A systematic review of physical activity and quality of life and well-being

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Abstract

Maintaining or improving quality of life (QoL) and well-being is a universal goal across the lifespan. Being physically active has been suggested as one way to enhance QoL and well-being. In this systematic review, conducted in part for the 2018 U.S. Health and Human Services Physical Activity Guidelines for Americans Scientific Advisory Committee Report, we examined the relationship between physical activity (PA) and QoL and well-being experienced by the general population across the lifespan and by persons with psychiatric and neurologic conditions. Systematic reviews, meta-analyses, and pooled analyses from 2006 to 2018 were used for the evidence base. Strong evidence (predominantly from randomized controlled trials [RCTs]) demonstrated that, for adults aged 18–65 years and older adults (primarily 65 years and older), PA improves QoL and well-being when compared with minimal or no-treatment controls. Moderate evidence indicated that PA improves QoL and well-being in individuals with schizophrenia and Parkinson's disease, and limited evidence indicated that PA improves QoL and well-being for youth and for adults with major clinical depression or bipolar disorder. Insufficient evidence existed for individuals with dementia because of a small number of studies with mixed results. Future high-quality research designs should include RCTs involving longer interventions testing different modes and intensities of PA in diverse populations of healthy people and individuals with cognitive (e.g., dementia) and mental health conditions (e.g., schizophrenia) to precisely characterize the effects of different forms of PA on aspects of QoL and well-being.

Implications

Practice: Researchers, educators, and providers should know that participation in regular physical activity (PA) is likely to improve quality of life (QoL) and well-being in many populations.

Policy: Enrolling samples of sufficient size and diversity to support intervention moderator analyses along with mediator analyses will provide useful information for adapting the interventions to optimize uptake among different subgroups.

Research: Incorporating diverse population subgroups, including diverse racial/ethnic groups and vulnerable and underrepresented population groups will expand the potential for having a broader public health impact in disseminating this research.

health symptoms and reflects the presence of positive aspects in one's life.

QoL has a hierarchical structure, with domain-specific components under the umbrella of overall QoL. One domain typically represents health-related

- Moderate evidence supports the **positive effects of PA on quality of life for individuals with schizophrenia.**
- These results come from consistent findings from studies involving inpatients and outpatients across the adult age span.

Physical activity and the prevention of psychosis

Physical activity and the prevention of psychosis

While the exact mechanisms are not fully understood, some ways are thought to be beneficial to prevent psychosis:

- **Stress Reduction:** High levels of stress are associated with an increased risk of developing mental health issues, including psychosis.
- **Neuroprotective Effects:** Exercise has been shown to have neuroprotective effects on the brain. It may help support the growth of new neurons (neurogenesis) and the formation of neural connections (synaptogenesis).
- **Cognitive Benefits:** Physical activity can enhance cognitive function, including memory and executive function. This may help individuals better manage stress and challenging situations, reducing the risk of developing psychotic symptoms.
- **Reduction of Inflammation:** Some research suggests that regular exercise can reduce systemic inflammation in the body. Elevated levels of inflammation have been associated with various mental health conditions, including psychosis. Exercise may help mitigate this risk.
- **Social Engagement:** Participating in group physical activities, such as sports or exercise classes, can promote social engagement and reduce social isolation.
- **Improved Sleep:** Regular physical activity can improve the quality of sleep. Sleep disturbances are common in individuals at risk for psychosis and may contribute to the development of symptoms.
- **Healthy Lifestyle Choices:** Engaging in physical activity is often part of a broader healthy lifestyle that includes a balanced diet and reduced substance use.

Physical activity and the prevention of psychosis

- Evidence from a meta-analysis of 5 prospective studies demonstrated that higher physical activity levels were associated with a **lower risk of incident psychosis or schizophrenia** (OR = 0.72, 95%CI = 0.53-0.99) (Brokmeier et al, 2020)
- However, when the analysis was limited to the two studies that adjusted for confounding factors, **the significant associations were no longer supported.**
- **The Mendelian randomization study that addressed the topic does not support the notion that physical activity protects from psychosis or schizophrenia (Sun et al, 2020).**
- **Although physical activity does not prevent the onset of psychosis, it is a protective factor against comorbidities, and improves social relations and quality of life.**

Motivation for physical activity in schizophrenia

It is neither legally nor ethically acceptable to impose any kind of activity on a patient. What's more, once the activity is no longer compulsory, the person will stop it.



Motivation for physical activity in schizophrenia

- Motivating a person with schizophrenia to engage in physical activity can be challenging!
- **However, it is possible!**
- Some tips: **establish trust and rapport, educate about benefits, set realistic goals, personalize the activity, create a routine, provide social support (including peers), monitor progress, consider medication side effects, offer incentives**

Motivation for physical activity in schizophrenia

MOTIVATIONAL INTERVIEWING

Motivational interviewing (MI) is a **client-centered counseling approach** that helps individuals explore their **ambivalence toward change**, strengthen their **motivation** for positive behavior change, and set **achievable goals**. It is a **collaborative, empathetic, and non-confrontational method** commonly used in healthcare and counseling to address a range of behavioral and lifestyle changes.

Motivation for physical activity in schizophrenia

MOTIVATIONAL INTERVIEWING

- Numerous studies have investigated MI as a technique for developing PA.
- This implies **adequate training for professionals**.
- It is frequently reported that patients suffering from **chronic illnesses** have a low rate of participation in physical activity. In order to encourage these people to change their sedentary behavior, MI has been suggested as a way of guiding them towards an active lifestyle.
- **However, MI remains of limited use in the case of chronic diseases**, given the large number of relapses and reorientations towards sedentary behavior.
- **Limited date in schizophrenia**

CONCLUSIONS

CONCLUSIONS

Nordin is developing a therapeutic relationship with the unit's physiotherapist.

The physiotherapist, who is trained in motivational interviewing, is responsible for motivating Nordin to visit the gym as part of an interdisciplinary care plan.

Together, they set up a progressive programme.

At no point do they talk about "symptoms" or "illness", but they both know that they need to get back into shape.

Nordin admits that he has "let himself go" and that sport can help him feel better.