

The Effect of Low-Impact Aerobic Exercise on Social Interaction in Patients with Schizophrenia at RSJD Dr. Arif Zainudin Surakarta

Olivia Safitri¹, Endang Sri Wahyuni²

^{1,2} Poltekkes Kemenkes Surakarta, Indonesia

*Corresponding Author: safitriolivia2@gmail.com

Article Information

Article history:

Received June 11, 2026 ;

Revised June 19, 2026 ;

Accepted June 26, 2026

Keywords:

low impact; aerobic exercise;
social interaction; SIAS;
schizophrenia

ABSTRACT

Background: Schizophrenia is a severe psychiatric disorder characterized by cognitive, emotional, and behavioral deficits, often accompanied by reduced social interaction that may hinder the rehabilitation process. Low-impact aerobic exercise has been proposed as a non-pharmacological intervention to promote physical activity while simultaneously providing opportunities for social engagement. This study aims to determine the effect of low-impact aerobic exercise on the social interaction ability of individuals with schizophrenia at RSJD Dr. Arif Zainudin Surakarta.

Methods: A quantitative pre-experimental study employing a one-group pretest-posttest design was conducted. Twenty-five participants diagnosed with schizophrenia were recruited through purposive sampling. The intervention consisted of low-impact aerobic exercise sessions administered five times per week, with each session lasting 30 minutes. Social interaction ability was assessed using the Social Interaction Anxiety Scale (SIAS). Changes in social interaction scores before and after the intervention were analyzed using the Wilcoxon Signed-Rank Test.

Results: Most participants were male (76%), in late adults (48%), unmarried (64%), had completed senior high school education (56%), and had a history of employment (78%). The greatest improvement in social interaction was observed among male participants (53%), those in early adulthood (57.1%), divorced individuals (50%), participants with elementary school education (50%), and those with a history of employment (41.1%). Statistical analysis revealed a significant difference between pre- and post-intervention social interaction scores ($p < 0.001$), indicating a significant improvement following the low-impact aerobic exercise program.

Conclusion: Low-impact aerobic exercise significantly improved social interaction abilities among individuals with schizophrenia at RSJD Dr. Arif Zainudin Surakarta.

© Copyright©2026 by authors, all rights reserved. Authors agree that this article remains permanently open access under the terms of the Creative Commons Attribution License 4.0 International License. Published by Indonesian Occupational Therapist Association.

1. INTRODUCTION

Schizophrenia is a chronic psychiatric disorder that affects cognition, emotion, perception, and behavior often manifested through hallucinations, delusions, and disorganized conduct [1]. The disorder remains a major global mental health concern because it contributes substantially to disability, reduced quality of life, and impaired social functioning. According to the World Health

Organization in 2021, approximately 24 million people worldwide were living with schizophrenia, representing about 1 in 300 individuals globally. In Indonesia, the prevalence of schizophrenia increased from 1.7 per 1,000 population in 2013 to 6.7 per 1,000 population in 2018 [2]. Central Java reported a prevalence of 8.7 per 1,000 populations, while Surakarta reached nearly 9 per 1,000 populations [3]. Furthermore, hospital medical record data from RSJD Dr. Arif Zainudin Surakarta documented 2,625 schizophrenia patients undergoing repeated hospitalization between 2022 and 2023 [2]. These figures indicate that schizophrenia remains a significant public health issue requiring comprehensive interventions that address not only clinical symptoms but also psychosocial functioning.

One of the most prominent challenges experienced by individuals with schizophrenia is impaired social interaction. Patients frequently demonstrate social withdrawal, limited communication skills, decreased motivation, and difficulties establishing interpersonal relationships. These impairments are often associated with both positive symptoms, such as hallucinations and delusions, and negative symptoms, including apathy and social isolation, which can hinder recovery and community reintegration [4,5]. Social interaction plays a fundamental role in psychological well-being because positive interpersonal relationships provide emotional support, enhance self-esteem, and facilitate participation in meaningful occupations. Conversely, inadequate social interaction may contribute to loneliness, stress, and reduced quality of life [6,7]. Therefore, improving social functioning has become an important goal in rehabilitation programs for individuals with schizophrenia.

Occupational therapy contributes significantly to psychosocial rehabilitation by facilitating engagement in meaningful activities that enhance social participation and interpersonal skills [8,9]. Among the various intervention approaches, physical activity-based programs have gained increasing attention because they provide both physiological and psychosocial benefits. Low-impact aerobic exercise is a structured physical activity characterized by rhythmic, low-intensity movements performed without excessive joint stress, making it suitable for individuals with mental health problems [10,11]. In addition to improving physical fitness, low-impact aerobic exercise promotes interaction among participants through shared group activities, potentially enhancing communication, cooperation, and social engagement.

Previous studies have demonstrated the positive effects of low-impact aerobic exercise on psychosocial outcomes among individuals with mental disorders. Salma et al. reported improvements in social interaction among schizophrenia patients following participation in low-impact aerobic exercise programs [12]. Subagiyo et al. also revealed that aerobic exercise improved interaction abilities among psychiatric patients with social isolation [13]. In addition to enhancing socialization outcomes, aerobic exercise has been reported to significantly improve social functioning and alleviate anxiety symptoms in individuals with schizophrenia [14].

Despite these promising findings, several limitations remain in the existing literature. Most previous studies focused on social isolation symptoms or emphasized physical and emotional benefits rather than directly examining social interaction as the primary outcome. In addition, some studies employed case-study designs or involved limited sample sizes, restricting the generalizability of their findings. Research investigating the effectiveness of structured low-impact aerobic exercise programs on social interaction among schizophrenia patients in psychiatric rehabilitation settings using standardized assessment instruments remains limited. Consequently, evidence regarding the direct effects of low-impact aerobic exercise on social interaction among individuals with schizophrenia remains limited.

The novelty of this study lies on its specific focus on social interaction outcomes among schizophrenia patients participating in a structured low-impact aerobic exercise program within a psychiatric rehabilitation setting. Unlike previous studies that primarily examined physical fitness,

socialization activities, or psychological symptoms, this study evaluates changes in social interaction using the Social Interaction Anxiety Scale (SIAS) as a standardized measurement tool. Therefore, this study aimed to examine the effect of low-impact aerobic exercise on social interaction among patients with schizophrenia at RSJD Dr. Arif Zainudin Surakarta by comparing pre-intervention and post-intervention SIAS scores. The findings are expected to strengthen the evidence supporting occupational therapy-based physical activity interventions as an effective strategy for improving social participation among individuals with schizophrenia.

2. MATERIALS AND METHODS

2.1 Study Design

This study employed a quantitative pre-experimental design using a one-group pre-test–post-test approach. This design was selected to evaluate changes in social interaction ability among schizophrenia patients before and after participation in a low-impact aerobic exercise program. Social interaction was measured at baseline (pre-test) and after completion of the intervention (post-test) to determine the effectiveness of the program.

2.2 Study Period and Location

The study was conducted at RSJD Dr. Arif Zainudin Surakarta, Central Java, Indonesia. Data collection and intervention implementation were carried out from July to August 2025 over a four-week period. During this period, participants attended scheduled low-impact aerobic exercise sessions as part of the rehabilitation program.

2.3 Population and Sample

The study population comprised individuals diagnosed with schizophrenia who were undergoing rehabilitation services at RSJD Dr. Arif Zainudin Surakarta. Participants were recruited through purposive sampling based on predefined eligibility criteria, including: (a) a confirmed diagnosis of schizophrenia, (b) the ability to comprehend and follow simple instructions, (c) sufficient physical capacity to engage in group-based aerobic exercise, and (d) willingness to participate in the study. Individuals with unstable psychiatric symptoms or physical conditions that could limit safe participation in the intervention were excluded.

A total of 25 participants enrolled in an inpatient rehabilitation program at RSJD Dr. Arif Zainudin Surakarta were recruited for this study. The sample size was determined based on the availability of eligible individuals with schizophrenia who were receiving rehabilitation services during the study period, met the predefined inclusion criteria, and provided informed consent to participate. This sample size is comparable to those employed in previous pre-experimental studies investigating psychosocial interventions for individuals with schizophrenia.

2.4 Intervention

The intervention consisted of a structured low-impact aerobic exercise program conducted in groups under the supervision of rehabilitation staff and researchers. Each exercise session lasted 30 minutes and was conducted five times per week during the intervention period.

Low-impact aerobic exercise was implemented in a group setting and consisted of three phases: warm-up, exercise, and cool-down. The warm-up phase lasted 5 minutes and included stretching and light mobility exercises. The exercise phase lasted 20 minutes and consisted of rhythmic low-impact aerobic movements synchronized with music, including marching in place, side steps, step touches, arm swings, and coordinated upper- and lower-extremity movements. Participants were instructed to maintain at least one foot in contact with the floor at all times to minimize physical strain and reduce injury risk. The cool-down phase lasted 5 minutes and included breathing exercises and stretching activities. Sessions were conducted in groups to encourage participation, communication, and social interaction among participants.

2.5 Instruments and Data Collection

Social interaction ability was assessed using the Social Interaction Anxiety Scale (SIAS), a standardized instrument developed by Mattick and Clarke (1998) to measure anxiety and difficulties experienced during social interactions. The SIAS has been widely applied in mental health research, consists of items that evaluate participants' comfort and confidence when engaging in interpersonal communication and social situations. Previous studies have demonstrated good psychometric properties of this instrument, with high internal consistency (Cronbach's $\alpha > 0.90$) and satisfactory construct validity across clinical and non-clinical populations.

Data collection was conducted in two stages. Prior to the intervention, participants completed the SIAS questionnaire as a pre-test assessment. Following completion of the four-week low-impact aerobic exercise program, participants completed the same questionnaire as a post-test assessment. The pre-test and post-test scores were then compared to determine changes in social interaction ability after the intervention.

2.6 Data Analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarize participant characteristics and SIAS scores. Data normality was assessed before inferential analysis. Since the data were not normally distributed, differences between pre-test and post-test scores were analysed using the Wilcoxon Signed-Rank Test. Statistical significance was established at $p < 0.05$.

2.7 Ethical Considerations

This study received ethical approval from the Health Research Ethics Committee of RSUD Dr. Moewardi (1.507 / VII / HREC / 2025) on 10 July 2025. Prior to participation, all participants were informed about the purpose and procedures of the study and provided informed consent. Participant confidentiality and anonymity were maintained throughout the research process, and all data were used solely for research purposes.

3. RESULTS

The characteristics of this study participants included age, gender, marital status, educational background, and employment history are presented in Table 1.

Table 1. Characteristics of Sample (n = 25)

Characteristics	Frequency	Percentage
Age		
Late Adolescence	2	8
Early Adulthood	7	28
Late Adulthood	12	48
Early Elderly	4	16
Gender		
Male	19	76
Female	6	24
Education		
Elementary School	4	16
Junior High School	6	24
Senior High School	14	56
College	1	4
Marital Status		
Single	16	64
Married	3	12
Divorced	6	24
Employment History		
Employed	17	68
Unemployed	8	32

The results of social interaction assessment before and after the low-impact aerobic exercise intervention are presented in Table 2.

Table 2. Wilcoxon Signed-Rank Analysis of SIAS Scores

Ranks	Frequency
Negative Ranks	25 ^a
Positive Ranks	0 ^b
Ties	0 ^c
Total	25

Note: Negative ranks represent participants whose SIAS scores decreased after the intervention. A lower SIAS score indicates reduced social anxiety and better social interaction ability.

Table 3 presents the comparison between pre-intervention and post-intervention social interaction scores. The findings indicate a statistically significant improvement in social interaction following the low-impact aerobic exercise intervention.

Table 3. Comparison of Pretest and Posttest SIAS Scores

	n	Median (minimum-maximum)	p-value
Pre-test	25	42 (26-69)	0,000
Post-test	25	29 (14-50)	

4. DISCUSSION

The results of this study demonstrated a significant improvement in social interaction among schizophrenia patients following participation in a low-impact aerobic exercise program. The Wilcoxon Signed Rank Test showed a statistically significant difference between pre-test and post-test scores ($p < 0.05$), indicating that the intervention positively influenced participants' social interaction abilities. These findings support the hypothesis that structured physical activity can enhance psychosocial functioning among individuals with schizophrenia. The improvement suggests that low-impact aerobic exercise not only promotes physical well-being but also provides opportunities for social engagement, thereby reducing tendencies toward social withdrawal and isolation. Considering that impaired social interaction is one of the major barriers to recovery and community participation among individuals with schizophrenia, the findings highlight the potential value of exercise-based interventions within psychiatric rehabilitation programs [4,5].

Several mechanisms may explain the observed improvement in social interaction. From a physiological perspective, aerobic exercise has been shown to improve cerebral blood flow, regulate neurotransmitter activity, reduce stress responses, and decrease anxiety symptoms, all of which contribute to better emotional regulation and social functioning [14]. Improved emotional stability may help individuals become more comfortable initiating and maintaining interpersonal interactions. In addition, low-impact aerobic exercise encourages active participation without excessive physical strain, making it suitable for individuals with psychiatric problems who may have limited physical endurance.

From a psychosocial perspective, the intervention was conducted in a group setting, creating opportunities for participants to communicate, cooperate, observe others, and engage in shared experiences. Such interactions may foster a sense of belonging and increase confidence in social situations. Repeated participation in group exercise can gradually reduce social anxiety and encourage more adaptive interpersonal behaviors [6,10]. Therefore, the positive changes observed in this study may reflect the combined influence of physiological benefits and enhanced social participation during the intervention process.

The findings are consistent with previous studies examining the effects of low-impact aerobic exercise and related physical activity interventions among individuals with schizophrenia. Salma et al. reported that low-impact aerobic exercise enhanced patients' willingness to socialize and express

positive emotions during group activities [12]. Likewise, Subagiyo et al. observed improved social interaction among psychiatric patients following participation in structured exercise programs [13]. These findings suggest that exercise-based group interventions may facilitate social engagement by providing opportunities for interpersonal communication, shared experiences, and emotional expression [13].

The present findings are also supported by Kimhy et al. (2021), who reported that aerobic exercise contributed to improvements in social functioning and communication while reducing psychological distress among individuals with schizophrenia [14]. While previous studies primarily focused on socialization skills, social isolation, emotional well-being, or physical fitness, the current study specifically examined social interaction outcomes using the Social Interaction Anxiety Scale (SIAS). This provides additional evidence regarding the effectiveness of low-impact aerobic exercise in addressing interpersonal interaction difficulties among schizophrenia patients.

The findings of this study are consistent with recent evidence indicating that aerobic exercise contributes to improved psychosocial outcomes among individuals with schizophrenia. Recent meta-analyses have reported that exercise interventions can reduce psychiatric symptoms, enhance social functioning, and promote participation in daily activities and recovery processes. Structured group-based exercise may facilitate social interaction by providing opportunities for communication, cooperation, and peer engagement within a supportive environment. Therefore, low-impact aerobic exercise can be considered a meaningful occupation that supports both physical and psychosocial rehabilitation in individuals with schizophrenia [18,19]. However, the observed improvements should be interpreted cautiously because participants continued to receive routine psychiatric treatment, including pharmacological therapy and rehabilitation services, during the study period. These concurrent interventions may have acted as confounding factors and contributed to improvements in social functioning alongside the low-impact aerobic exercise program.

Overall, the findings indicate that low-impact aerobic exercise is a promising intervention for improving social interaction among individuals with schizophrenia. The significant improvement observed following the intervention supports its integration into occupational therapy and psychiatric rehabilitation programs as a strategy for enhancing social participation, psychosocial recovery, and quality of life.

From a theoretical perspective, these findings reinforce the role of occupational therapy in addressing social deficits through meaningful activity-based interventions. Occupational therapy emphasizes participation in occupations that promote engagement, social inclusion, and overall well-being. Low-impact aerobic exercise can be viewed as a therapeutic occupation because it integrates physical activity with opportunities for social participation and interaction [8,15]. Through structured group exercise, individuals are encouraged to communicate, follow shared routines, and interact with peers in a supportive environment. Such experiences may strengthen social competence and facilitate psychosocial recovery.

From an occupational therapy perspective, the positive outcomes observed in this study may not only be attributed to the physical benefits of low-impact aerobic exercise but also to the therapeutic process facilitated by the occupational therapist throughout the intervention [16]. During group-based exercise sessions, occupational therapists actively structure the environment to promote social participation, encourage interpersonal interaction, and support engagement in meaningful group activities. Through verbal cueing, modeling appropriate social behaviors, providing positive reinforcement, and facilitating peer interaction, therapists create opportunities for participants to initiate communication, respond to others, cooperate within a group, and develop confidence in social situations. These therapeutic interactions reflect the occupational therapy principles of therapeutic use of self and activity-based intervention, in which meaningful occupations are used as a medium to improve functional performance and participation. Consequently, low-impact aerobic exercise serves

not only as a physical activity intervention but also as a therapeutic occupation that enables individuals with schizophrenia to practice and strengthen social participation skills within a supportive and structured environment. This interpretation is consistent with previous occupational therapy studies reporting that participation in structured group interventions contributes to improvements in social functioning, interpersonal behavior, and community participation among individuals with schizophrenia [17].

Practically, the findings suggest that low-impact aerobic exercise can be incorporated into psychiatric rehabilitation programs as a cost-effective and non-pharmacological intervention to improve social interaction among individuals with schizophrenia. Occupational therapists and mental health professionals may utilize group-based aerobic exercise as part of comprehensive treatment plans aimed at enhancing social participation, communication skills, and community reintegration. Improved social interaction may ultimately contribute to greater independence, stronger interpersonal relationships, and better quality of life [6,10].

Despite the promising findings, several limitations should be acknowledged. First, the study employed a pre-experimental one-group pre-test–post-test design without a control group, limiting the ability to establish causal relationships between the intervention and the observed outcomes. Second, the relatively small sample size ($n = 25$) and recruitment from a single psychiatric hospital may limit the generalizability of the findings. Third, the intervention period was relatively short and may not fully capture long-term effects on social interaction. Additionally, the use of a self-report instrument may introduce response bias related to participants' perceptions and experiences.

Future studies should employ randomized controlled trial designs with larger and more diverse samples to strengthen the evidence regarding the effectiveness of low-impact aerobic exercise. Further research could explore different exercise intensities, durations, and group compositions to identify optimal intervention conditions. Investigating the integration of aerobic exercise with other psychosocial interventions, such as art therapy, music therapy, or social skills training, may also provide additional benefits. Moreover, incorporating qualitative approaches and patient-reported experiences could provide deeper insight into how exercise influences social confidence, participation, and recovery processes.

5. CONCLUSIONS

The findings of this study indicate that low-impact aerobic exercise can enhance social interaction among individuals with schizophrenia receiving rehabilitation services at RSJD Dr. Arif Zainudin Surakarta by providing structured opportunities for communication, cooperation, social participation, and the expression of positive emotions. As a meaningful occupation, low-impact aerobic exercise not only promotes physical activity but also supports psychosocial recovery by reducing social withdrawal and encouraging engagement in interpersonal interactions, thereby contributing to improved social functioning and quality of life. These findings support the role of occupational therapy in integrating activity-based interventions as a medium for social rehabilitation and suggest that psychiatric hospitals and other mental health facilities incorporate structured group exercise programs into rehabilitation services to foster participation and recovery. Future research is recommended to involve larger and more diverse populations, evaluate longer intervention periods and long-term outcomes, refine exercise protocols, and explore the integration of low-impact aerobic exercise with other occupation-based and psychosocial interventions to further strengthen both theoretical understanding and clinical practice.

ACKNOWLEDGEMENT

The author would like to express sincere gratitude to RSJD Dr. Arif Zainudin Surakarta for granting permission and providing support during the research process. Appreciation is also extended to the Occupational Therapy Department of Poltekkes Kemenkes Surakarta for academic guidance and support throughout the study. The author is grateful to all participants who willingly took part in this research and to all healthcare professionals and staff who contributed to the implementation of the study and the completion of this article.

REFERENCES

- [1]. Silviyana A, Kusumajaya H, Fitri N. Faktor-Faktor yang Berhubungan dengan Kekambuhan pada Pasien Skizofrenia. *Jurnal Penelitian Perawat Profesional*, Feb;6(1):139–48, 2024
- [2]. Wulandari R, Herawati VD, Sutrisno. Hubungan Dukungan Keluarga dan Kepatuhan Minum Obat dengan Tingkat Kekambuhan pada Orang dengan Skizofrenia (ODS) di RSJD Surakarta. *Jurnal Kesehatan [Internet]*, Dec;3(2):247–66, 2023, Available from: <https://jurnal.usahidsolo.ac.id/>
- [3]. Wulandari A, Febriana A. Kejadian Skizofrenia pada Pasien Rawat Inap di RSUD Dr. H. Soewondo Kendal. *Higeia Journal Of Public Health Research And Development*, 7(4):562–73, 2023;
- [4]. Prasetyo AY, Apriliyani I, Dewi FK, Program M, Keperawatan S, Kesehatan F, et al. Pengaruh Terapi Aktivitas Kelompok Sosialisasi terhadap Kemampuan Interaksi Sosial Pasien Skizofrenia di Bangsal Jiwa RSI Banjarnegara. Oct;85–1591, 2021
- [5]. Putri AN. Latihan keterampilan sosial: Teknik meningkatkan kemampuan interaksi sosial skizofrenia. *Procedia: Studi Kasus dan Intervensi Psikologi*, Dec 29;11(4):127–33, 2023, doi:10.22219/procedia.11i4.24445
- [6]. Fahri LM, Qusyairi LAH. Interaksi Sosial Dalam Proses Pembelajaran. *PALAPA: Jurnal Studi Keislaman dan Ilmu Pendidikan*, May;7(1):149–66, 2019
- [7]. Sibuea SY. Faktor yang Mempengaruhi Interaksi Sosial Klien Penderita Skizofrenia di UPTD Lingkungan Pondok Sosial Keputih. *Jurnal Penelitian Psikologi*, 10(2):475–90, 2023
- [8]. Dwi R, Surin B, Noviekayati I, Pratitis NT. Terapi Okupasi Bagi Penyandang Skizofrenia Di Uptd Liponsos Kota Surabaya Studi Fenomenologi. *Psikosains: Jurnal Penelitian dan Pemikiran Psikologi [Internet]*, Feb;19(1):104–16, 2024, Available from: <https://journal.umg.ac.id/index.php/psikosains>
- [9]. Putra AA, Sumartyawati NM, Santosa IME, Susilawati R. Pengaruh Terapi Aktivitas Kelompok Sosialisasi Sesi 1-7 dan Terapi Okupasi Terhadap Kemampuan Komunikasi Verbal Pasien Isolasi Sosial. *Journal Nursing Research Publication Media (NURSEPEDIA)*, Oct 31;1(3):126–32, 2022, doi:10.55887/nrpm.1i3.21
- [10]. Putra IDS, Susilowati T, Yuniati W. Penerapan Senam Aerobik Low Impact Terhadap Penurunan Skor Pada Pasien Halusinasi di RSJD Dr. Arif Zainudin Surakarta. *Jurnal Ilmiah Penelitian Mandira Cendikia*, Sep;1(2), 2023
- [11]. Manjo YH, Fauzi A. Pengaruh Senam Aerobik Low Impact dan Mix Impact Terhadap Perubahan Tekanan Darah Pada Penderita Hipertensi. *MAHES: Malahayati Health Student Journal*, Nov 1;3(11):3452–79, 2023, doi:10.33024/mahesa.3i11.11085
- [12]. Salma A zahra F, Nabila S, Hertinjung WS. Penerapan Senam Aerobik Low Impact pada Kemampuan Bersosialisasi: Studi Kasus Pasien Skizofrenia. *Schema: Journal of Psychological Research*, Nov 18;47–52, 2023, doi:10.29313/schema.0i0.12346

- [13]. Subagiyo A, Rochmawati H, Sawab. PENGARUH Terapi Senam Aerobik Low Impact Terhadap Kemampuan Berinteraksi Pada Klien Isolasi Sosial Di Rsj Dr. Amino Gondohutomo Provinsi Jawa Tengah. *Jurnal Ilmu Keperawatan dan Kebidanan*. 2015;1–9.
- [14]. Kimhy D, Tay C, Vakhrusheva J, Beck-Felts K, Ospina LH, Ifrah C, et al. Enhancement of aerobic fitness improves social functioning in individuals with schizophrenia. *Eur Arch Psychiatry Clin Neurosci*, Mar 1;271(2):367–76, 2021, doi:10.1007/s00406-020-01220-0 PubMed PMID: 33389108.
- [15]. AOTA. Occupational Therapy Practice Framework: Domain and Process—Fourth Edition. *The American Journal of Occupational Therapy*, Aug 1;741:7412410010p1–87, 2020, doi:10.5014/ajot.2020.74S2001
- [16]. Ercan S. The Effectiveness of A Combination of Occupational Therapy and Social Skills Training in People with Schizophrenia: A Rater-Blinded Randomized Controlled Trial. *British Journal of Occupational Therapy*; 0(0):1–10, 2021, doi:10.1177/03080226211022953
- [17]. Nagashima I, Hayasaka T, Teruya K. Factors Encouraging Participation in Social Activities After Hospital Discharge in People with Severe Mental Illness Who Received Occupational Therapy. *Front Psychiatry*, 15:1–10, 2024, doi:10.3389/fpsyt.2024.1421390
- [18]. Cui W, Liu Z, Liang C, Zhao Z. Comparative Efficacy of Different Types of Exercise Modalities on Psychiatric Symptomatology in Patients With Schizophrenia: A Systematic Review With Network Meta-Analysis. *Sci Rep.*, 14(1):1–14, 2024, doi:10.1038/s41598-024-57081-3 PubMed PMID: 38528063.
- [19]. Brobakken MF, Nygård M, Vedul-Kjelsås E, Harvey PD, Wang E. Everyday Function in Schizophrenia: The Impact of Aerobic Endurance and Skeletal Muscle Strength. *Schizophr Res.*, 270:144–51, 2024, doi:10.1016/j.schres.2024.06.027 PubMed PMID: 38908280.