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Perceptions of an out-of-hospital physical exercise program among people with schizophrenia: CORTEX-SP study

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Abstract

Schizophrenia affects 24 million people worldwide and it is the third most disabling health condition in terms of severity. Its course is unpredictable, and the symptoms vary depending on the person. The pharmacological treatment is associated with many side effects while physical exercise programs are considered an interesting and useful non-pharmacological resource in the prevention and treatment of the pathology. The objective of the present study was to analyze the perceptions of the CORTEX-SP study among people with schizophrenia. The study involved a total sample of 35 people, and open semi structured interviews were used to collect the data. The interviews were carried out before and after the program. Content analysis resulted in three main categories: intrapersonal, interpersonal and environmental factors. Results reveal that the symptoms of the illness, as well as the pharmacological treatment, are most of the times barriers when it comes to practicing physical activity. Participants gave great importance to interpersonal relationships, specially to the exercise specialist and at a lesser extent to relatives and health professionals. Although there were some differences in relation to the number of people and their characteristics, all agreed that the fact that the program was out-of-hospital, had been a great facilitator to participate in the program. Also, regarding the characteristics of the program, everyone seemed happy with the type of exercise realized and the environment created at the sessions. These findings are relevant for health and physical activity professionals, educators, sports organizations and policymakers for promoting this type of programs.

Keywords: Schizophrenia, Physical Exercise, Physical Activity, External Facilities

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Introduction

Schizophrenia (SP) affects 24 million people worldwide (American Psychiatric Association, 2013) and is the third most disabling health condition in terms of severity. Although some patients are able to fully recover, approximately three-fourths have an ongoing disability with relapses (Rastad, Martin, & Asenlöf, 2014). The illness usually begins in the late second or third decade of life and its course is unpredictable, as the frequency, number and types of psychotic symptoms vary depending on the specific psychotic disorder and the patient (Lieberman & First, 2018). The symptoms of the illness can be positive symptoms, such as hallucinations, delusions and thought or movement disorders. Negative symptoms, like loss of motivation, loss of emotions and emotional withdrawal, lack of energy, sadness and social isolation motivated by a lack of desire for establishing relationships, and finally, cognitive symptoms, including difficulties in processing information, making decisions and paying attention (World Health Organization, 1993). In this sense, people with SP often have numerous barriers and limitations that hinder their participation and inclusion in society (American Psychiatric Association, 2013) as they often feel discriminated (Mestdagh & Hansen, 2014), and not perceiving themselves (or not being perceived by others) as "normal" can make it difficult to connect with others and achieve a sense of belonging (Laliberte-Rudman, Yu, Scott, & Pajouhandeh, 2000).

The insertion into society of the person with SP is given by the control of psychotic symptoms among others (Ciudad et al., 2011) and for this, psychotherapeutic and pharmacological treatment play a fundamental role (Bueno-Antequera & Munguía-Izquierdo, 2020) on the positive symptoms of the disease (World Health Organization, 1993) despite being associated with serious side effects like weight gain (Green, Patel, Goisman, Allison, & Blackburn, 2000). However, there seems to be an absence of effective treatments for the negative symptoms added to the cognitive dysfunction that occurs in this disease (Miyamoto, Miyake, Jarskog, Fleischhacker, & Lieberman, 2012). In this regard, nowadays, physical exercise (PE) programs stand as a more than interesting and useful non-pharmacological resource in the prevention and treatment of mental disorders such as SP (Bueno-Antequera & Munguía-Izquierdo, 2020; Callaghan, 2004; Crone, Diane & Guy, 2008). In fact, they favor the symptoms caused by the disease and cognition, helping to improve the quality of life of people with this pathology (Stubbs et al., 2018).

Due to their generally sedentary lifestyles, people with SP have, among others, a reduced life expectancy, a reduced cardiorespiratory and muscular fitness, an increased risk of cardiovascular disease, metabolic syndrome, hypertension and hyperlipidaemia compared to the general population (Bueno-Antequera & Munguía-Izquierdo, 2020), as well as an increased risk of obesity caused by the weight gain caused by antipsychotic drugs (Green et al., 2000). In this sense, PE interventions based on light activities such as walking, are beneficial in short-term weight reduction, thus reducing body mass index or body fat (Soundy, Andrew, Muhamed, Stubbs, Probst, & Vancampfort, 2014) and in the perception that people with SP have of the immediate benefits of physical activity (PA) (Rastad et al., 2014). Indeed, the feeling of change is a motivator for continued PA practice in this type of population (Karlsson & Danielsson, 2020) along with getting outdoors. In this way, people with this condition consider walking in nature as relaxing and good for mental calmness, relate being physically active to feeling happiness and joy, and feel that they stimulate thoughts, conversations and have a greater degree of independence (Rastad et al., 2014).

Despite this, in order to achieve significant improvements in psychiatric symptoms, functioning, comorbid disorders and neurocognition, it is not enough to walk, but rather to perform interventions that use approximately 90 minutes of moderate to vigorous aerobic exercise per week (Firth, Cotter, Elliott, French, & Yung, 2015). Also, it is important to consider that the High Intensity Interval Training (HIIT) is more effective than continuous moderate exercise in individuals with SP to improve cardiorespiratory fitness (Chalfoun, Karelis, Stip, & Abdel-Baki, 2016).

Yet, a problem with this type of population is that, due to the characteristics of the disease, some individuals do not adhere to exercise unless staff members encourage and incentivize them to participate in PA programs (Soundy et al., 2014). Furthermore, it is strongly recommended that PE programs for people with SP are led and supervised by exercise professionals, as this is associated with better outcomes and lower dropout rates. And at the same time, this population should be under the care of a health care provider and should consult a health professional or PA specialist about the types and amounts of activity appropriate for their abilities and chronic conditions (Stubbs et al., 2018).

In this way, psychiatric hospitals provide a favorable environment for initiating PA, as they offer a wide variety of PA and exercise programs to their inpatients. These activities include relaxation activities, sports therapy, general PA, physiotherapy, body therapy,

hippotherapy, tai chi and the like (Brand et al., 2016). Nevertheless, only 25%-50% of hospitalized patients participate in such programs, usually due to lack of motivation and low levels of cardiorespiratory fitness and PA. In addition, once they are discharged, they are no longer able to participate in these in-hospital programs (Brand et al., 2016) and find it difficult to maintain sports habits, either due to lack of out-of-hospital programs, lack of family or health care support, environment, personal economy or social context (Karlsson & Danielsson, 2020).

In order to respond to this situation, the COgnitive Rehabilitation and Training with Exercise for SchizoPhrenia (CORTEX-SP) study was created in 2018 in Vitoria-Gasteiz (Basque Country). In this study, participants with SP receive an intensive concurrent PE program lasting 5 months at some out-of-hospital facilities located in Mendizorrotza. Concurrent training is defined as performing both endurance and resistance training within the same training program (Bishop, Bartlett, Fyfe, & Lee, 2019). The sessions take place three times per week and are supervised by PE specialists. The sessions include a warm-up, HIIT on a stationary bicycle and some strength exercises (See Annexes 1 and 2).

For all these reasons and taking into account the characteristics of people with SP and the characteristics of the PE programs carried out so far, the aim of the present study was to find out the perceptions that people with SP have regarding the CORTEX-SP study.

And to do so, a socio-ecological perspective has been taken into consideration, a multidimensional approach that interrelates individual, social and environmental factors that influence people's (non-) participation in PA and sports (López-Cañada, Devís-Devís, Pereira-García, & Pérez-Samaniego, 2021) .

Methods

Study Participants

The study had a qualitative design, aimed at discovering, capturing and understanding a theory, an explanation or a meaning (Ruiz-Olabuenaga, 2013). It involved a total sample of 35 people with SP (9 women and 26 men) ranging from 18 to 65 years of age. The inclusion criteria to participate in the study were: 1) being diagnosed with SP, 2) being participants in the CORTEX-SP study and 3) being more than 18 years old. All study participants were informed about the study, participated voluntarily and signed the informed consent form. They were individually interviewed at two different stages: at the beginning of the intervention

(PRE-Interview) and at the end of the program, once the five months had concluded (POST-Interview).

Data Collection Technique

The technique chosen to obtain the research data was an open semi structured interview (Rubio & Varas, 2004), giving the possibility of adding, transforming or eliminating questions according to the interests of the interviewer, as the aim of the interview is to find what is significant and important for the informant, its meanings, perspectives and interpretations, and how the world is seen, classified and highlighted (Ruiz-Olabuénaga, 2003). The interviews had a duration of 30-45 minutes, and they were carried out with the help of a script asking from the general to the specific matters. In the PRE-Interview questions regarding the conception and motivation of the program, conception of PE and sport, expectations of their participation and habits of life were asked. On the other hand, in the POST-Interview, requests related to the context of the program (space, instructors, duration and timetable), social relations, benefits perceived, and level of satisfaction were made.

Procedure

The meetings were held individually, after agreement with each participant according to their availability and in each case agreeing on the time and place. Each participant accepted the prior consent before being interviewed and taped. The interviewee and the interviewer were confronted and placed on the same level, setting aside social boundaries and stigmas. Furthermore, an attempt was made to create a suitable, close and friendly context (Valles, 2002) with the aim of eliminating any misgivings that the interviewees might have prior to the interview and confirming that the information provided by them was very important and showing interest at all times.

Analysis Of Data

For the analysis of the data from the personal interviews, first the interview sessions were transcribed, writing down the information collected, and secondly, following the recommendations of content analysis given by Rapley (2014), the transcripts were read over and over again. Then, combining inductive and deductive ways, a semantic content analysis was carried out, coding the most significant parts in relation to the research question. To do so, the Nvivo10 program (QSR International) was used. According to the socioecological factors,

the main categories were created considering what emerged from the interviewees and if necessary, new categories were restructured and created to those previously defined and the subcategories of each of them were established (Escobar, Francy, & Bonilla-Jimenez, n.d.). A category system was built through the different codes derived from the data (Table 1). Finally, to guarantee the quality of the qualitative methods used, the evaluation criteria defined by (Zitomer & Goodwin, 2014) were followed.

Table 1. Category system built for data analysis

Categories	Sub-categories
Intrapersonal	Characteristics and clinical consequences of the disease Pharmacotherapy
Interpersonal	Exercise specialists People outside the program <ul style="list-style-type: none"> - Health professionals - Family and friends Relationship associated to the practice <ul style="list-style-type: none"> - Group-individual - Only patients-mixed
Environmental factors	Out-of-hospital program Participants' perception regarding the program

Results and Discussion

The following themes emerged from the data analysis:

- Intrapersonal perceptions
- Interpersonal perceptions
- Environmental factors

The findings include quotations from participants to enable their voices to be heard within the text. These are presented in italics with names changed to ensure anonymity. Theory and data are integrated to allow the development of links between the categories and other authors' statements (Crone, Diane, 2007).

"Inappetence To Do Things".

The intrapersonal category included topics such as the characteristics and clinical consequences of the disease, as well as the effects of pharmacological treatment.

Participants in the CORTEX-SP study report feeling listless, apathetic and sad, as described by the WHO (World Health Organization, 1993), and may even suffer symptoms of depression: *"Well look, if I don't take my antidepressant pill, I'm crying all day long"* (Jenny). These symptoms, in many cases, cause the patient with SP to lean towards social isolation and leads to not wanting to participate in group activities (Gomes et al., 2014): *"I'm very strange for making friends, I'm a very solitary person and I don't usually hang out with people, it's very difficult for me to start talking to people and all that, and to meet and... well... it's very difficult for me"* (Peter), although it is true that the illness and its symptoms can vary greatly depending on the psychotic disorder suffered (Lieberman & First, 2018): *"There are days and days, there are days of sadness and days of joy"* (Arthur).

The symptoms associated with the illness have a direct link with the pharmacological treatment used to deal with the illness, while they are effective for positive symptoms such as thought disorders, *"My problem is that I am thinking all the time about things, things that have happened to me and that don't go away, and if I don't take my medication, I would be thinking about my things all the time, talking to myself and laughing alone"* (John), as well as to reduce delusions and hallucinations in which they hear voices that prevent them from practicing PA, they are associated with extrapyramidal neurological side effects and symptoms that affect the

individual's motor skills (Miyamoto et al., 2012). As a consequence, antipsychotics with fewer motor side effects compared to first-generation agents have been developed in recent years (Huang & Chen, 2005). This fact has led some patients with SP to find it useful to take antipsychotic medication regularly as it makes them feel better and, as a result, makes it easier for them to be physically more active (Rastad et al., 2014). However, although no serious side effects were noted among the interviewees, they did report other, lighter side effects such as tremors, feeling more tired, drowsier, and loss of strength, which in many cases led to weight gain: *"The medication leaves me flattened, I don't have strength to do sport and so on... Inappetence to do things, not to move, to stay still. That's the problem and that's why you gain so much weight, you also get a bit more anxious, and you feel like doing nothing and eating. And what happens in the end? You get fat"* (John). In addition to the weight gain, the negative impact on body image is another of the side effects associated with the pharmacological treatment (Johnstone, Nicol, Donaghy, & Lawrie, 2009), factors that, together with the characteristics of the illness, do not favor the practice of PA among people with SP (Soundy, Andrew, Stubbs, Probst, Hemmings, & Vancampfort, 2014). Even at times, the side effects are not compatible with any other activity: *"I have toxic psychosis, and when I take the medication, after half an hour or so, I'm floating, and my eyes go up and I can't even watch a film... I can't concentrate, because my eyes go up and everything, it's very serious"* (Larry).

“The Staff Second To None, The Best Of The Study”

Within the interpersonal relationships, three main categories were distinguished: relationship with the exercise specialists, support from people outside the intervention and relationships associated with the practice.

Exercise Specialists

The richness and depth of expression provided by participants in relation to the staff members is clear and unequivocal: *"The staff second to none.... The best in the study"* (Stephen). The qualities and attitudes of the staff members in exercise programs, for example, equity and inclusion, have previously been identified as influential in people's experiences and in the achievement of mental health benefits (Crone, D., Smith, & Gough, 2005). In this regard, participants have attached particular importance to the attitude of the specialists in the program and are grateful for the motivation, good atmosphere and enthusiasm provided by them: *"With an embittered you don't want to come, but Michael gets you motivated quickly. He lifts your*

self-esteem and you get to do whatever you thought you couldn't" (Megan). In addition, the atmosphere of safety, security and apprehension created is seen as a facilitator for participation. Furthermore, it is clear that the opportunity to be guided by a sport professional is appreciated, especially in comparison to clinical staff in hospitals: *"I think you guys know more about sport than a nurse, don't you? I mean, each has its own functions, but well, there has to be supervision because if you do whatever you want you will get injured for sure..."* (Arthur), an opinion shared by Stubbs et al. (2018), who suggests that it is highly recommended that PE programs for people with SP should be lead and supervised by qualified exercise professionals and not by healthcare staff. Indeed, these authors suggest that the motivational component and follow-up are essential to achieve adherence and to have lower dropout rates. What is more, the follow-up carried out by the exercise specialists has been considered one of the keys of the study: *"My husband told me that a very important part of the study has been the daily follow-up, you know, the commitment that you have achieved, because even if he tried, I wouldn't want to go and if I didn't go to the session, then Michael would call me and motivate me to go the next day"* (Ingrid).

People Outside The Program

Attitudes towards external relationships were differentiated into relationships with health staff members and relationships with friends and family.

People with SP are vulnerable to negative comparisons with others and have a reduced sense of self-esteem and confidence (Roberts & Bailey, 2011) so their participation in PA can be negatively influenced. For this reason, it is important for patients to establish good relationships with health professionals, especially with their psychiatrists (Soundy, Andrew, Faulkner, & Taylor, 2007), and indeed, participants state as follows: *"with my psychiatrist I have trust. And as I know that she is behind this intervention, it kind of encourages me... it's just that with her everything is fine"* (Peter). In addition, health professionals see PA as an important part of holistic care and provide informational support to people with serious mental illness (Happell, Scott, Platania-Phung, & Nankivell, 2012). Moreover, some participants commented that if it had not been for the perseverance and encouragement of the practitioner, they would not have been encouraged to participate, therefore, support from the health professional can be seen as a facilitator for engaging in PA (Soundy et al., 2014).

In terms of relationships with friends and family, in general, all participants agreed that their relatives thought it was a good idea for them to participate in the program. In fact, an indispensable part of the overall strategy for the treatment of the disease is associated with the support of family and friends (González, 2004), and that is why, when a participant missed a session or dropped out the program, they were disappointed: *"When I dropped out my mother looked disgruntled, and she blamed me for it. Well, the usual stuff..."* (Alexander). Relatives can help patients by implementing prompts, reminders and reinforcing activities of daily living (Gandhi, Gurusamy, Damodharan, Ganesan, & Palaniappan, 2019), including accompanying participants in their activities, exercising with them or helping them plan strategies to maintain the exercise habits (Karlsson & Danielsson, 2020) as one program participant noted: *"my roommate usually goes jogging, and the other day I went with him. Just ten minutes, not a lot but that day I kind of encouraged myself to go and see how it went, even if it's only for ten minutes"* (Shawn).

Relationships Associated To The Practice

In terms of relationships with peers, two broad categories were included, whether the exercise was carried out in groups or individually and whether the program was carried out with only diagnosed patients or with the general population.

On the one hand, two clear ideas were differentiated regarding the social performance of PA: in a group or individually. The fact of attending a group program, as well as the commitment established towards the group, contributed to creating more adherence: *"If you go with a group it forces you more because if it is on my own, one day I might do something, another day I might not feel like going, but the other way, since you have already signed up, you have to go not to look bad"* (Tom). In addition, it was found that attending structured and guided sessions helped participants to participate, results that coincide with those obtained by Bryant, Craik, & McKay (2005) where planned activities were valued as a meaningful and motivating occupation. Furthermore, being part of a PA group has many benefits for patients, including providing positive relationships and connection with others, giving a reason to be active, helping to motivate people and providing a forum for modelling behavior, and helping patients to initiate other activities (Soundy, Andy et al., 2014). These same authors also argue that achieving a sense of cohesion and belonging with other patients facilitates participation and reduces anxiety levels. However, other participants felt that they preferred exercising on

their own, either because they have always done it that way or because they feel they are making the most of their time.

On the other hand, two opinions were highlighted regarding the type of participants in the program. In the first, a preference of participating with people with the pathology was defended, as there is a feeling of rejection, prejudice and insecurity from those who do not have the disease: *"the gestures, the looks, the comments"* (Brad). Being in a group with other people who also experience symptoms of the disease, as well as being in a physical or emotional place where they do not feel threatened, is associated with a sense of safety and comfort (Mason & Holt, 2012). It is also true that in order to avoid situations where negative comparisons can be made about each person's ability (Chapman, Fraser, Brown, & Burton, 2016), participants prefer to exercise with people at their level: *"that way we are all equal, we do as much as we can and there are no comparisons"* (Anthony).

Other participants, however, commented that it would be better to participate with all kinds of people in order to normalize the illness and not always be marginalized: *"Better to be with other people so that it's not a ghetto, so that sick people are not pushed into a corner"* (Peter). In this way, people with SP can improve their quality of life by rebuilding a sense of self and social identity (Davidson & Roe, 2007). In this sense, Marilyn commented: *"I like meeting all kinds of people, not sick people"*. Moreover, Carless & Douglas (2008) argue that some patients feel that by normalizing their lives they will achieve a more positive identity and a sense of independence from the culture of mental illness.

"Outside The Psychiatric Hospital"

In this category, the opinions of the participants were collected regarding the characteristics of the project carried out, such as the PE program developed, the place of practice and its access, as well as the timetable and duration.

In terms of the PE program, in general, most of the participants were happy with the type of exercise performed. They felt that concurrent training was enjoyable because of the change of exercises *"it was good because it was diversified, it wasn't a whole hour doing the same exercise all the time"* (Arthur). According to Ho, Dhaliwal, Hills, & Pal (2012) concurrent exercise has greater benefits than separate aerobic and strength exercise and it is therefore considered a good non-pharmacological strategy for the treatment of SP. Furthermore, PE is

known as an important and low-cost therapeutic tool, where two sessions per week with progressive load are sufficient to produce benefits (Silva et al., 2015). In fact, participants perceived that they felt more and more agile, with better mobility, better cardiorespiratory capacity and even slimmer: *"Physically I did notice a change because at the beginning it was very difficult, then it was less difficult, and I got into a rhythm. It's like they say, you do a bit of running, you do a bit of running and then you get into the rhythm"* (John).

Besides, all sessions were conducted with music because it provides more positive affective responses, improves physical performance, helps reduce perceived exertion and improves the person's physiological efficiency (Terry, Karageorghis, Curran, Martin, & Parsons-Smith, 2020). In addition, music therapy seems to address especially motivational, emotional and relational aspects, which helps patients with SP improve their performance (Geretsegger et al., 2017) and therefore, the vast majority of participants highly appreciated conducting the sessions with music: *"with music better, livelier, more at ease"* (Anthony).

The physical environment where PA takes place also plays a key role in PE-based interventions in the mental health population, as people's mood can be affected depending on the environment (Barton, Griffin, & Pretty, 2012). In our study, the fact that the program was out-of-hospital encouraged most of patients to participate, as this was in many cases related to getting out of the hospital, feeling the air and seeing different people. According Chapman et al. (2016), there is a preference for doing PE in parks and community gyms, away from clinical centers, as patients feel that they have been in the hospital long enough: *"Prefer, I prefer to go outside the hospital, because I have spent enough time there"* (Shawn). Also, several participants related the hospital with negative memories, that is why they preferred to change the environment: *"Once I left the psychiatric hospital behind, I don't want to remember it again, I'll start remembering things from the past and it's going to be horrible"* (Dan).

In this study, as in others (Gomes et al., 2014), participants arrived at the sports facilities by their own means. Although sometimes the lack of available transportation to the facilities where PA programs are developed can be seen as a barrier (Wilcox et al., 2006), this situation was not observed in the present study, possibly due to the good location and distance of the unit to the sports facilities: *"When I went to do the study, I was at the psychiatric hospital unit, and it was near by"* (John).

Regarding the timetable, the answers were different for the hospitalized participants and for those who lived outside the hospital. The hospitalized patients have a scheduled calendar with the activities that include two free hours in the evening, so they all prefer to do the PE before those hours *"I had problems with the psychiatrist because he sent me during my free time"* (John). On the other hand, participants who live at home prefer to attend the program in the evenings as they tend to have other tasks during the mornings. However, some of them felt that during autumn-winter they did not like going in and out of the program at night, as this created a feeling of sadness or even fear. Although weather and time have also been perceived as barriers in other studies (Karlsson & Danielsson, 2020), they are not seen as an impediment to practicing PA because they are usually short and momentary interruptions.

Finally, the participants' opinion concerning the duration was that, although many found the five-month stay very long at the beginning, they were comfortable with it and at the end it went quickly: *"In the beginning it seemed like a lot and now it is not so long"* (Peter). In fact, many would like to be able to continue attending programs of this type, but the offer is still very little (Brand et al., 2016).

Conclusions

The present study aimed to analyze the different perceptions that people with SP have regarding the PE program of the CORTEX-SP study and concluded that the symptoms of the illness, as well as the pharmacological treatment, are most of the time barriers when it comes to practicing PA. Participants gave great importance to interpersonal relationships and the role of the exercise specialist was clearly seen as a fundamental axis of the program, although the figure of the healthcare members, as well as the support of family and friends, were also significant. Even if there were different opinions regarding the number of people and their characteristics, all agreed that the fact that the program was out-of-hospital, had been a great facilitator to participate in the program. Finally, as to the characteristics of the program, everyone seemed happy with the type of exercise realized and the environment created at the sessions. That is why, these findings are relevant for health and PA professionals, educators, sports organizations and policymakers for promoting this type of programs. Programs based on concurrent exercise which include HIIT and strength training, where the sessions are guided by exercise specialists and if possible, which are conducted outside the hospitals.

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.
- Barton, J., Griffin, M., & Pretty, J. (2012). Exercise-, nature- and socially interactive-based initiatives improve mood and self-esteem in the clinical population. *Perspectives in Public Health, 132*(2), 89-96. doi:10.1177/1757913910393862
- Bishop, D. J., Bartlett, J., Fyfe, J., & Lee, M. (2019). Methodological considerations for concurrent training: Scientific basics and practical applications. *Concurrent aerobic and strength training* (pp. 183-196)
- Brand, S., Colledge, F., Beeler, N., Pühse, U., Kalak, N., Sadeghi Bahmani, D., . . . Gerber, M. (2016). The current state of physical activity and exercise programs in German-speaking, swiss psychiatric hospitals: Results from a brief online survey. *Neuropsychiatric Disease and Treatment, 12*, 1309-1317. doi:10.2147/NDT.S107313
- Bryant, W., Craik, C., & McKay, E. (2005). Perspectives of day and accommodation services for people with enduring mental illness. *Journal of Mental Health, 14*(2), 109-120. doi:10.1080/09638230500073600
- Bueno-Antequera, J., & Munguía-Izquierdo, D. (2020). Exercise and schizophrenia. *Advances in Experimental Medicine and Biology, 1228*, 317-332. doi:10.1007/978-981-15-1792-1_21
- Callaghan, P. (2004). Exercise: A neglected intervention in mental health care? *Journal of Psychiatric and Mental Health Nursing, 11*(4), 476-483. doi:10.1111/j.1365-2850.2004.00751.x

- Carless, D., & Douglas, K. (2008). Narrative, identity and mental health: How men with serious mental illness re-story their lives through sport and exercise. *Psychology of Sport and Exercise, 9*, 576-594. doi:10.1016/j.psychsport.2007.08.002
- Chalfoun, C., Karelis, A. D., Stip, E., & Abdel-Baki, A. (2016). Running for your life: A review of physical activity and cardiovascular disease risk reduction in individuals with schizophrenia. *Journal of Sports Sciences, 34*(16), 1500-1515.
doi:10.1080/02640414.2015.1119875
- Chapman, J. J., Fraser, S. J., Brown, W. J., & Burton, N. W. (2016). Physical activity preferences, motivators, barriers and attitudes of adults with mental illness. *Journal of Mental Health (Abingdon, England), 25*(5), 448-454.
doi:10.3109/09638237.2016.1167847
- Ciudad, A., Bobes, J., Álvarez, E., San, L., Novick, D., & Gilaberte, I. (2011). Resultados clínicos relevantes en esquizofrenia: Remisión y recuperación. *Revista De Psiquiatría Y Salud Mental - Journal of Psychiatry and Mental Health, 4*(1), 53-65.
doi:10.1016/j.rpsm.2010.12.002
- Crone, D., Smith, A., & Gough, B. (2005). 'I feel totally at one, totally alive and totally happy': A psycho-social explanation of the physical activity and mental health relationship. *Health Education Research, 20*(5), 600-611. doi:10.1093/her/cyh007
- Crone, D. (2007). Walking back to health: A qualitative investigation into service users' experiences of a walking project. *Issues in Mental Health Nursing, 28*(2), 167-183.
doi:10.1080/01612840601096453

- Crone, D., & Guy, H. (2008). 'I know it is only exercise, but to me it is something that keeps me going': A qualitative approach to understanding mental health service users' experiences of sports therapy. *International Journal of Mental Health Nursing*, 17(3), 197-207. doi:10.1111/j.1447-0349.2008.00529.x
- Davidson, L., & Roe, D. (2007). Recovery from versus recovery in serious mental illness: One strategy for lessening confusion plaguing recovery. *Journal of Mental Health*, 16(4), 459-470. doi:10.1080/09638230701482394
- Escobar, J., Francy, Y., & Bonilla-Jimenez, I. (n.d). *Grupos focales: Una guía conceptual y metodológica*
- Firth, J., Cotter, J., Elliott, R., French, P., & Yung, A. R. (2015). A systematic review and meta-analysis of exercise interventions in schizophrenia patients. *Psychological Medicine*, 45(7), 1343-1361. doi:10.1017/S0033291714003110
- Gandhi, S., Gurusamy, J., Damodharan, D., Ganesan, V., & Palaniappan, M. (2019). Facilitators of healthy lifestyle behaviors in persons with schizophrenia-A qualitative feasibility pilot study. *Asian Journal of Psychiatry*, 40, 3-8.
doi:10.1016/j.ajp.2019.01.003
- Geretsegger, M., Mössler, K. A., Bieleninik, Ł, Chen, X., Heldal, T. O., & Gold, C. (2017). Music therapy for people with schizophrenia and schizophrenia-like disorders. *The Cochrane Database of Systematic Reviews*, 5, CD004025.
doi:10.1002/14651858.CD004025.pub4
- Gomes, E., Bastos, T., Probst, M., Ribeiro, J. C., Silva, G., & Corredeira, R. (2014). Effects of a group physical activity program on physical fitness and quality of life in individuals

with schizophrenia. *Mental Health and Physical Activity*, 7(3), 155-162.

doi:10.1016/j.mhpa.2014.07.002

González, R. T. (2004). *Guía de intervención familiar en la esquizofrenia* Editorial Glosa, SL.

Green, A. I., Patel, J. K., Goisman, R. M., Allison, D. B., & Blackburn, G. (2000). Weight gain from novel antipsychotic drugs: Need for action. *General Hospital Psychiatry*, 22(4), 224-235. doi:10.1016/s0163-8343(00)00081-5

Happell, B., Scott, D., Platania-Phung, C., & Nankivell, J. (2012). Mental health and physical activity.5(1), 4-12. Retrieved from <https://www.sciencedirect.com/science/journal/17552966>

Ho, S. S., Dhaliwal, S. S., Hills, A. P., & Pal, S. (2012). The effect of 12 weeks of aerobic, resistance or combination exercise training on cardiovascular risk factors in the overweight and obese in a randomized trial. *BMC Public Health*, 12, 704. doi:10.1186/1471-2458-12-704

Huang, T., & Chen, J. (2005). Serum lipid profiles and schizophrenia: Effects of conventional or atypical antipsychotic drugs in taiwan. *Schizophrenia Research*, 80(1), 55-59. doi:10.1016/j.schres.2005.05.001

Johnstone, R., Nicol, K., Donaghy, M., & Lawrie, S. (2009). Barriers to uptake of physical activity in community-based patients with schizophrenia. *J Ment Health*, 18, 523-532. doi:10.3109/09638230903111114

- Karlsson, V., & Danielsson, L. (2020). Motivators for patients with schizophrenia spectrum disorders to start and maintain exercising: A qualitative interview study. *European Journal of Physiotherapy*, 0(0), 1-9. doi:10.1080/21679169.2020.1776386
- Laliberte-Rudman, D., Yu, B., Scott, E., & Pajouhandeh, P. (2000). Exploration of the perspectives of persons with schizophrenia regarding quality of life. *The American Journal of Occupational Therapy: Official Publication of the American Occupational Therapy Association*, 54(2), 137-147. doi:10.5014/ajot.54.2.137
- Lieberman, J. A., & First, M. B. (2018). Psychotic disorders. *The New England Journal of Medicine*, 379(3), 270-280. doi:10.1056/NEJMr1801490
- López-Cañada, E., Devís-Devís, J., Pereira-García, S., & Pérez-Samaniego, V. (2021). Socio-ecological analysis of trans people's participation in physical activity and sport. *International Review for the Sociology of Sport*, 56(1), 62-80. doi:10.1177/1012690219887174
- Mason, O. J., & Holt, R. (2012). Mental health and physical activity interventions: A review of the qualitative literature. *Journal of Mental Health (Abingdon, England)*, 21(3), 274-284. doi:10.3109/09638237.2011.648344
- Mestdagh, A., & Hansen, B. (2014). Stigma in patients with schizophrenia receiving community mental health care: A review of qualitative studies. *Social Psychiatry and Psychiatric Epidemiology*, 49(1), 79-87. doi:10.1007/s00127-013-0729-4
- Miyamoto, S., Miyake, N., Jarskog, L. F., Fleischhacker, W. W., & Lieberman, J. A. (2012). Pharmacological treatment of schizophrenia: A critical review of the pharmacology and

clinical effects of current and future therapeutic agents. *Molecular Psychiatry*, 17(12), 1206-1227. doi:10.1038/mp.2012.47

Nvivo 10. QRS International Pty. Ltd. (Version 10.0.637.o). Qualitative Solutions for research software. Australia.

Rapley, T. (2014). Los análisis de la conversación, del discurso y de documentos en Investigación Cualitativa, Morata, Madrid.

Rastad, C., Martin, C., & Asenlöf, P. (2014). Barriers, benefits, and strategies for physical activity in patients with schizophrenia. *Physical Therapy*, 94(10), 1467-1479. doi:10.2522/ptj.20120443

Roberts, S. H., & Bailey, J. E. (2011). Incentives and barriers to lifestyle interventions for people with severe mental illness: A narrative synthesis of quantitative, qualitative and mixed methods studies. *Journal of Advanced Nursing*, 67(4), 690-708. doi:10.1111/j.1365-2648.2010.05546.x

Rubio, M. J. y Varas, J. (2004). El análisis de la realidad en la intervención social/métodos y técnicas de investigación. Madrid: Editorial CCS.

Ruiz-Olabuénaga, J. I. (2003). Metodología de la investigación cualitativa. Bilbo: Universidad de Deusto.

Schmidt, C. (2004): «The Analysis of Semi-structured Interviews», In A companion to qualitative research, Sage Publications, London, 253-258.

Silva, B. A. E., Cassilhas, R. C., Attux, C., Cordeiro, Q., Gadelha, A. L., Telles, B. A., . . . de Mello, M. T. (2015). A 20-week program of resistance or concurrent exercise improves

symptoms of schizophrenia: Results of a blind, randomized controlled trial. *Revista Brasileira De Psiquiatria*, 37(4), 271-279. doi:10.1590/1516-4446-2014-1595

Soundy, A., Faulkner, G., & Taylor, A. (2007). Exploring variability and perceptions of lifestyle physical activity among individuals with severe and enduring mental health problems: A qualitative study. *Journal of Mental Health*, 16(4), 493-503.
doi:10.1080/09638230701482345

Soundy, A., Muhamed, A., Stubbs, B., Probst, M., & Vancampfort, D. (2014). The benefits of walking for individuals with schizophrenia spectrum disorders: A systematic review. *International Journal of Therapy and Rehabilitation*, 21(9), 410-420.
doi:10.12968/ijtr.2014.21.9.410

Soundy, A., Stubbs, B., Probst, M., Hemmings, L., & Vancampfort, D. (2014). Barriers to and facilitators of physical activity among persons with schizophrenia: A survey of physical therapists. *Psychiatric Services (Washington, D.C.)*, 65(5), 693-696.
doi:10.1176/appi.ps.201300276

Soundy, A., Freeman, P., Stubbs, B., Probst, M., Coffee, P., & Vancampfort, D. (2014). The transcending benefits of physical activity for individuals with schizophrenia: A systematic review and meta-ethnography. *Psychiatry Research*, 220(1), 11-19.
doi:10.1016/j.psychres.2014.07.083

Stubbs, B., Vancampfort, D., Hallgren, M., Firth, J., Veronese, N., Solmi, M., . . . Kahl, K. G. (2018). EPA guidance on physical activity as a treatment for severe mental illness: A meta-review of the evidence and position statement from the european psychiatric association (EPA), supported by the international organization of physical therapists in

mental health (IOPTMH). *European Psychiatry: The Journal of the Association of European Psychiatrists*, 54, 124-144. doi:10.1016/j.eurpsy.2018.07.004

Terry, P. C., Karageorghis, C. I., Curran, M. L., Martin, O. V., & Parsons-Smith, R. L. (2020). Effects of music in exercise and sport: A meta-analytic review. *Psychological Bulletin*, 146(2), 91-117. doi:10.1037/bul0000216

Valles, M. S. (2002). *Entrevistas cualitativas. colección "cuadernos metodológicos"*, 32 (32nd ed.). Madrid: Centro de Investigaciones Sociológicas.

Wilcox, S., Der Ananian, C., Abbott, J., Vrazel, J., Ramsey, C., Sharpe, P. A., & Brady, T. (2006). Perceived exercise barriers, enablers, and benefits among exercising and nonexercising adults with arthritis: Results from a qualitative study. *Arthritis and Rheumatism*, 55(4), 616-627. doi:10.1002/art.22098

World Health Organization. (1993). *The ICD-10 classification of mental and behavioural disorders: Diagnostic criteria for research (vol.2)* World Health Organization.

Zitomer, M. R., & Goodwin, D. (2014). Gauging the quality of qualitative research in adapted physical activity. *Adapted Physical Activity Quarterly: APAQ*, 31(3), 193-218. doi:10.1123/apaq.2013-0084












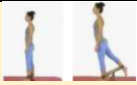

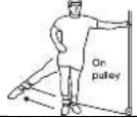











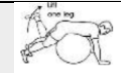
Annexes

Annex 1. Aerobic training protocol

Week	High intensity intervals	Moderate intensity intervals
	Volume (min)	Volume (min)
1	2'	18'
2	2'30''	17'30''
3	3'	17'
4	3'30''	16'30''
5	4'	16'
6-10	4'30''	15'30''
11-20	4'30''	15'30''

Annex 2. Strength-Resistance program

Protocol: 1' work/30'' rest

MONDAY		WEDNESDAY		THURSDAY	
Squat with fit ball 		TRX Squat 		Squat 	
Triceps with TheraBand 		Biceps curl TheraBand 		Chest fit ball 	
Bosu Up 		Step 		Lunge TRX 	
TRX back and chest 		Chest TheraBand 		Hamstrings TheraBand 	
TheraBand Loop 		Hip TheraBand 		Shoulders 	
Press Shoulders 		Shoulders TheraBand 		Step 	
Step 		Hamstring fit ball 		Triceps 	
Chin-Ups 		Bosu balance 		Ball passes 	
Crunches with fit ball 		Lumbar fit ball 		Plank 