

**Contributions of complementary therapies and other strategies to the treatment of
schizophrenia: an integrative review**

**Contribuições de terapias complementares e outras estratégias para o tratamento da
esquizofrenia: uma revisão integrativa**

**Contribuciones a las terapias complementarias y otras estrategias para el tratamiento de
la esquizofrenia: una revisión integradora**

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Abstract

This study is an integrative literature review about complementary therapies and other strategies to treat schizophrenia. The search was carried out in the Virtual Health Library, CAPES, PUBMED and Cochrane databases, with the descriptor “complementary medicine for schizophrenia”. We considered in this review publications between 2015 and 2020, written in Portuguese, English or Spanish. After applying all inclusion and exclusion criteria, 39 (thirty-nine) publications were selected. Among the analyzed strategies, the practice of Yoga presented more publications. We noted that complementary therapies related to schizophrenia are still under study, to prove how they improve schizophrenia symptoms. Therefore, the advancement and development of such practices, can assist in pharmacological treatment as allies in facing the difficulties related to schizophrenia.

Keywords: Schizophrenia; Complementary therapies; Yoga.

Resumo

Este estudo é uma revisão integrativa da literatura sobre terapias complementares e outras estratégias para o tratamento da esquizofrenia. A busca foi realizada nas bases de dados Biblioteca Virtual em Saúde, CAPES, PUBMED e Cochrane, com o descritor “medicina complementar para esquizofrenia”. Consideramos nesta revisão publicações entre 2015 e 2020, redigidas em português, inglês ou espanhol. Após à aplicação de todos os critérios de inclusão e exclusão, foram selecionadas 39 (trinta e nove) publicações. Dentre as estratégias analisadas, a prática do Yoga apresentou mais publicações. Observamos que as terapias complementares relacionadas à esquizofrenia ainda estão em estudo, para comprovar como melhoram os sintomas da esquizofrenia. Portanto, o avanço e o desenvolvimento de tais práticas, podem auxiliar no tratamento farmacológico como aliados no enfrentamento das dificuldades relacionadas à esquizofrenia.

Palavras-chave: Esquizofrenia; Terapias complementares; Ioga.

Resumen

Este estudio es una revisión integradora de la literatura sobre terapias complementarias y otras estrategias para tratar la esquizofrenia. La búsqueda se realizó en las bases de datos de la Biblioteca Virtual en Salud, CAPES, PUBMED y Cochrane, con el descriptor “medicina complementaria para la esquizofrenia”. En esta revisión se consideraron publicaciones entre 2015 y 2020, escritas en portugués, inglés o español. Después de aplicar todos los criterios de inclusión y exclusión, se seleccionaron 39 (treinta y nueve) publicaciones. Entre las estrategias analizadas, la práctica del Yoga presentó más publicaciones. Notamos que las terapias complementarias relacionadas con la esquizofrenia aún están en estudio para demostrar cómo mejoran los síntomas de la esquizofrenia. Por tanto, el avance y desarrollo de tales prácticas, puede ayudar en el tratamiento farmacológico como aliados para afrontar las dificultades relacionadas con la esquizofrenia.

Palabras clave: esquizofrenia; Terapias complementarias; Yoga.

1. Introduction

An estimated 1% of the population suffers with schizophrenia (Mari, et al., 2000). This disease is a mental disorder, a chronic or recurrent psychosis that can cause deterioration

of functional capacity in long term (Silva, 2006). In this psychosis, a rupture in reality occurs, and the patient may present a combination of delusions, hallucinations, chaotic behavior and disorganized/incoherent thoughts (Oliveira, 2012).

Regarding the schizophrenia origin, it is complex and can be biological, sociological and psychological (Silva, 2006; Brasil, 2013). The increase in dopaminergic activity has been related as the biological cause of schizophrenia (Bressan & Pilowskyb, 2003), and the treatment may involve drugs that act in this way (Giacon, 2006). Another explanation for the pathology has been related to genetic factors. At least 108 genes have already been related to this disease (Izquierdo & Quevedo, 2020) and the NRG1 gene may be associated with schizophrenia (Silva, 2015).

For the disease onset, problems in childhood and in the social environment seems to be important (Vallada Filho & Samaia, 2000). In addition, some studies suggest that the use of drugs favors schizophrenia (Fanous & Kendler, 2008; Fernandes, et al., 2017). Another important factor linked to schizophrenia is inflammation since a significant number of patients have high levels of cytokines and C-reactive protein (Aguiar, et al., 2010) in plasma. In this sense, research suggests the existence of a chronic inflammatory state in patients with schizophrenia. Because of this, non-steroidal anti-inflammatory drugs, such as acetylsalicylic acid or celecoxib, have been used to complete the treatment (Silva, 2016).

The treatment of schizophrenia involves a set of measures to alleviate the symptoms (Giacon, 2006). The treatment foundation is still the use of antipsychotic drugs (Moraes, 2010), which can be associated with individual or group psychotherapy (Durão, et al., 2005). The inclusion of psychotherapy aims to improve social relationships, communication, reestablishment of emotional patterns and thoughts, and helps to deal with the disease (Giacon, 2006). The last alternative is hospitalization, used when the patient has severe symptoms which compromise his judgment, hygiene, safety, nutrition, etc. (Ipuchima, et al., 2019).

Integrative and Complementary Practices (PICS) are treatments that use therapeutic resources based on traditional knowledge, aimed at preventing various diseases and as palliative treatments in some chronic diseases. In Brazil, the Unified Health System (SUS) offers 29 PICS procedures, in primary care, to the population. Scientific evidence has shown the benefits of integrated treatment between conventional medicine and integrative and complementary practices (Brasil, 2015). However, the use of PICs in patients with schizophrenia is not yet common.

In addition to these therapeutic alternatives, integrative practices have been used as a complementary treatment for schizophrenia in other countries. This study evaluated the benefit of using complementary integrative practices to treat symptoms and adverse events related to its treatment. We also analyzed other practices used in the treatment of this disease.

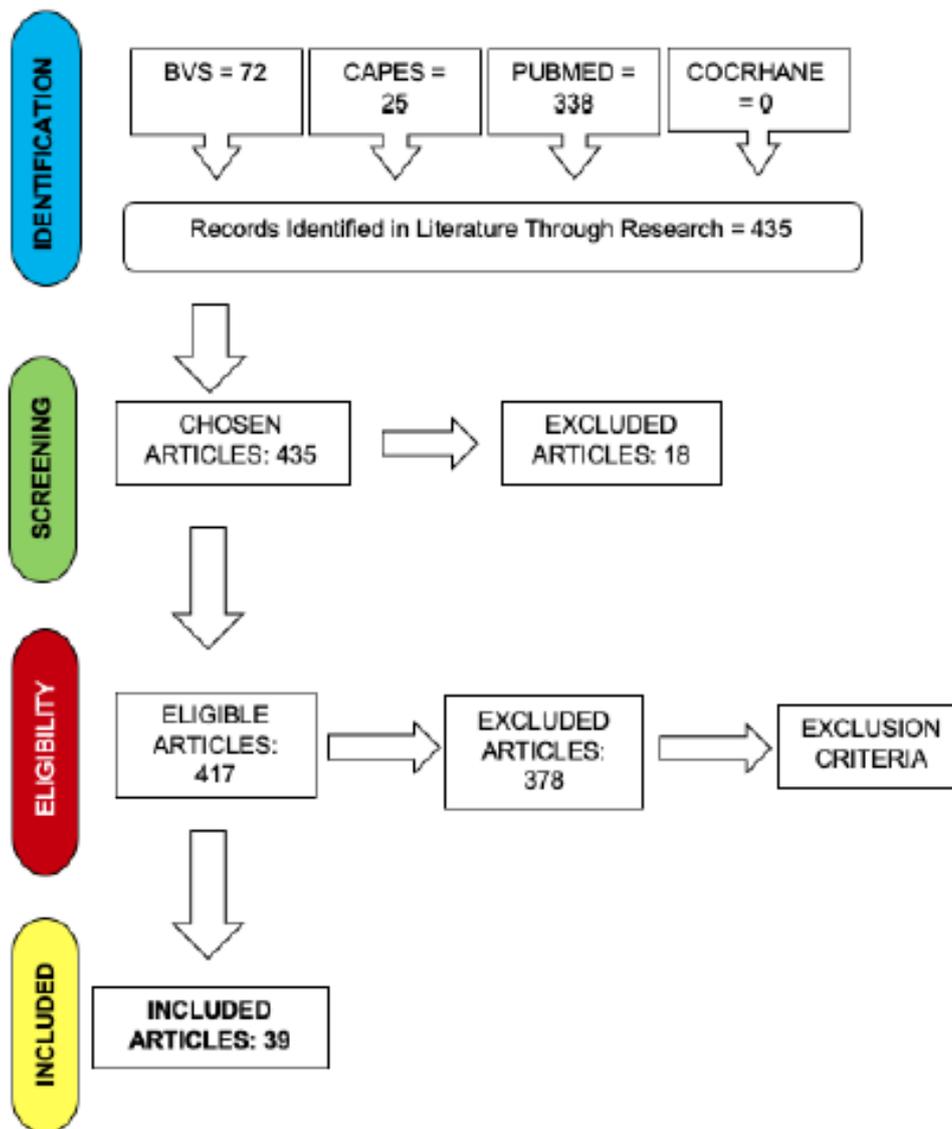
2. Methods

It is an integrative literature review, with a qualitative approach, in which the bibliographic (Pereira, et al., 2018; Cesario, et al., 2020) survey was carried out in the Virtual Health Library (VHL), CAPES PERIODIC, PUBMED and COCHRANE databases, between January and April 2020. The inclusion criteria were publications from the last 5 years; online access to the full content; and articles written in Portuguese, English and Spanish that deal with complementary therapies for the treatment of schizophrenia. All ethical principles, copyrights and references were obeyed throughout the research. Exclusion criteria were: articles in languages other than Portuguese, English and Spanish; letters; duplicate publications; articles without free access to full content; incomplete abstracts; editorial notes; articles with pharmacological and/or conventional treatments and/or do not deal with integrative practices applied in the schizophrenia treatment.

For searching articles, the following descriptors were used: “Complementary medicine for schizophrenia” and “Complementary integrative practices to treat schizophrenia”. This search resulted in 435 articles for screening (BVS = 72, CAPES PERIODIC = 25, PUBMED = 338 and COCHRANE = 0). Initially, the title and the abstract were read, if compatible with the theme, the work was included. Eighteen articles were eliminated because they were in duplicate, generating a total of 417.

When the title and abstract were analyzed, 98 articles were excluded because they did not fit the theme, 11 were also excluded for presenting only the abstract and 05 for lack of full access to the text. At the end, 303 eligible papers remained, however, it was not possible to access 13 papers in full and, therefore, these were excluded, 238 articles that evaded the topic or in languages other than those chosen, and 13 articles from publications in the period prior to 2015, leaving 39 articles for review. The procedure for articles identification, screening and eligibility to the analysis is shown in Figure 1.

Figure 1. Flowchart of article selection according to database.



Source: Authors.

For articles inclusion or exclusion, two reviewers read, independently, the titles and abstracts, and those considered potentially relevant were obtained for complete analysis. When there were discrepancies, a third reviewer was consulted to review compliance with the inclusion criteria.

Data analysis was performed according to the following criteria: the type of complementary therapy used, the purpose of its use and the contribution to the treatment of schizophrenia.

3. Results

After reading the titles, abstracts and full article, 39 articles were included. From these, 13 studies are related to the practice of Yoga, 6 address music therapy, 1 deals with acupuncture and 1 about Tai-chi, 2 explore Traditional Chinese Medicine and its practices, 1 addresses electroacupuncture, 2 discuss nutritional approaches such as Gluten-free diet, 2 deal with the influence of physical exercises and dance, 3 approach art therapy and 1 horticulture, 3 investigate psychotherapy and 4 studies deal with mindfulness treatments, symptom management, study of a predictive biomarker improvement in cognitive and psychosocial functioning and the effect of bathing and foot massage in schizophrenic patients (Table 1).

Patients with schizophrenia treated with antipsychotics underwent treatment with yoga in order to reduce the signs and symptoms of the disease (Cherubal, et al., 2019; rao & menon, 2016), such as the depression and cognitive correction in schizophrenia (Bhatia, et al., 2017; Cherubal, et al., 2019; Deshpande, et al., 2016). This intervention resulted in an improvement in general attentional skills (Deshpande, et al., 2016), and reduced depression and anxiety stress, generating well-being (Cherubal, et al., 2019).

Yoga was also used to treat side effects caused by antipsychotics (Verma, et al., 2018), with improvement of the main side problems: psychological (sleep, memory, concentration oneiric activity, etc.), with $p = 0.004$; neurological effects (tone, stiffness, tremor, etc.), with $p = 0.035$; other side effects (such as headache, skin rashes, pigmentation, etc.), with $p = 0.000$ (Verma, et al., 2018).

All of these results were achieved at the end of the study (5 months). Thus, a significant improvement in cognitive functions and negative symptoms in patients with schizophrenia can be seen (Verma, et al., 2018).

There is also preliminary evidence identified from yoga on cognitive deficits and negative symptoms of schizophrenia. However, it is still necessary to identify the active components of yoga that mediate these therapeutic effects, for a better scientific understanding of how these components influence the brain. In addition to providing a biologically plausible framework for understanding the therapeutic effects, this traditional practice allows physicians to use it in clinical practice to help patients with schizophrenia (Mehta, et al., 2016).

When yoga was compared to exercises focused on body health or physical fitness related to performance, speech therapy, art therapy, dance therapy, dramatic therapy, music therapy and writing therapy, the study that deals with yoga as part of a care package versus

non-standard care for schizophrenia, did not find sufficient evidence for the acceptability of this intervention (Broderick & Vancampfort, 2019). However, another study used ten experts in yoga therapy who consented to validate a project with a yoga module. This validation resulted in a yoga-based module, developed for schizophrenia, which was accepted by most experts from different yoga schools. These modules were later used successfully for depression and cognitive disorders. The evaluators also agreed that awareness-based breathing and relaxation exercises are important and should be part of the yoga module (Govindaraj, et al., 2016).

Another important point is about the effects of practicing yoga on chairs, which shows significant improvements in flexibility, hand grip and muscular resistance of the lower limbs, contributing to reduce the risk of falls and other unwanted consequences in psychiatric patients (Ikai, et al., 2017). The Functional Remission of General Schizophrenia scale (FROGS), on the other hand, also presented the positive effects of yoga on schizophrenic patients (Table 1). When comparing the results, the patients in the experimental group obtained an increase in the functional remission ($p < 0.05$), proving that yoga can be recommended (Kavak & Ekinci, 2016).

In general, the intra- and intergroup comparison of pre-post yoga data showed statistically significant differences ($p < 0.001$) for all three parameters: mental well-being, anxiety and depression (Table 1). The main findings of these studies show that yoga has significant benefits in reducing the average clinical scores in patients (Table 1). All studies also highlighted the advantage of yoga over exercises in reducing average clinical scores and improving social occupational functioning in patients with schizophrenia (Table 1).

The publications referring to Music Therapy (MT) demonstrated favorable results as a complementary practice in the treatment of schizophrenia (TSENG, 2016). Studies showed the participation of patients who use antipsychotics in music therapy group presented significant improvements ($p \leq 0.0001$) when compared to the group that did not participate (Volpe, 2018). The TM group showed an improvement in the degree of cooperation and relaxation (Table 1).

The TM has shown great positive effects, mainly on psychotic symptoms, general negative symptoms, depression and anxiety related to schizophrenia and improvement in patients' quality of life of the (Table 1). However, the effects of music therapy can take time. Clear effects of this therapy have been observed in medium term (3 to 6 months), and they may increase over time, depending on the number of sessions provided in each of the studies (Geretsegger, et al., 2017; Witusik & Pietras, 2019).

When comparing the Traditional Chinese Medicine (TCM) with antipsychotic therapy, TCM showed significant improvements in clinical effects ($p < 0.00001$), indicating that this practice, as an adjuvant therapy, can contribute to improve effectiveness of clinical treatment in patients with refractory schizophrenia (Wei, et al., 2018). Another issue was the positive findings observed about the effects of this practice on medication adherence, resulting in better adherence to treatment with antipsychotics (Table 1). However, due to the broad concept of TCM, a study suggests more specific intervention terms, as *Ginkgo biloba*, acupuncture, Wendan decoction and Shugan Jieyu capsule are also recognized as non-pharmacological interventions (Table 1).

Regarding treatment in patients with chronic schizophrenia, acupuncture and Tai-Chi are effective interventions, capable of improving sleepiness, mood and social skills (Table 1). Both can be considered as an adequate complement to the treatment of these patients since they improve treatment results, because even after the application of acupuncture, there was still the occurrence of hallucinations, but with reduced pain and suffering (Bosch, et al., 2015; Kang, et al., 2016). In addition, electroacupuncture demonstrated cognitive benefits in patients with schizophrenia (Table 1).

Articles related to nutritional approaches highlighted the relationship between good nutrition in the treatment of schizophrenia. Gluten-free diets showed improvement in acutely exacerbated symptoms, however further studies in this area can be developed to understand the influence of gluten sensitivity and inflammation biomarkers (Levinta, et al., 2018). Moreover, there are possibilities to generate advances in the characterization of inflammatory markers to help in the selection of benefited patients (Table 1). Such studies also reported that a gluten-free, protein-rich diet is more viable and less costly, promoting significant feelings as the reduction of anxiety, and depression. In contrast, there was an emphasis on an orthomolecular approach, with high consumption of vitamins and Omega 3 oils, which did not help in the treatment and contributed to episodes of relapse, without preventing the onset of symptoms (Levinta, et al., 2018; Royal, 2016).

The practice of physical activities, conscious exercises and dance, showed benefits in patients with schizophrenia, since health and well-being can be achieved by body movement (Table 1). Furthermore, dance therapy also refers to the space created to patients according to the hospital environment they live in, in order to explore the unexplored spaces without cause discomfort between them (Table 1). Thus, the silence of voices and the vocation in the dance gesture were observed in the patients who participated in this complementary practice (Table 1; Lippi & Petit, 2017). In general, it is necessary to stimulate physical exercise programs for

a longer time, since the association between mental illness and physical activity shows positive effects in the improvement of psychotic symptoms (Li, et al., 2018).

The arts are presented as a therapy directed to treat schizophrenia, demonstrating there is active research in this area, as an example we have the use of Creative Art Therapy (CAT) for serious mental illnesses (Table 1). However, it was difficult to identify patients involved in art therapy, as many were not willing to engage, leading to a high dropout rate (. In addition, the effectiveness of art therapy in reducing symptoms of psychosis remains inconclusive, as it is necessary to detect the best strategy for each mental illness (Chiang, et al., 2019; Attard & Larkin, 2016).

Psychotherapy was also one of the results of this review, being a strategy focused mainly on the implicit and pre-reflexive experience, using non-verbal techniques. The main themes addressed in psychotherapy articles were: body-mind connection; be agile and capable; being unique and worthy (accepted for who you are); changing interactions (engaging in authentic interpersonal contact); being part of a group (feeling integrated); hope and investment in the future (Galbusera, et al., 2017). Thus, such practice introduced to schizophrenic patients demonstrated reductions in general psychiatric symptoms, with improvements after therapy (Table 1).

The effectiveness of body-oriented psychotherapy (BPT) was assessed in a study that found significant improvement in negative symptoms of schizophrenia (Table 1). According to Galbusera, et al., (2017) the results are significant, considering the lack of effective treatment for negative symptoms, in addition to the side effects of drug treatment. Another study identified an artificial therapy program called “going beyond schizophrenia” (GBTS) in prisoners with schizophrenia in mainland China, which despite the limitations of the study, the capture of quantitative data allowed to support the benefits of this therapy in prison settings (Table 1; Aziz, et al., 2016; Galbusera, et al., 2017).

Religious belief through the role of healers stands out as a form of psychotherapy related to adherence to drug treatment, impacting the psychopathology and psychoeducation of these patients (Table 1; Aziz, et al., 2016). Psychoeducation was a predictor of medication adherence, while involvement with healers predicted non-adherence (Table 1).

The practices with the fewest results found in our research were horticulture, mindfulness therapy, effects of the auditory hallucinatory symptom management program (AHSM) and bathing and foot massage in patients with schizophrenia (Table 1). All of these studies demonstrated a reduction in emotional symptoms and recovery from schizophrenic symptoms; the importance of physical care, which helps patients with schizophrenia to

recover the relationship between their divided mind and body and reduce the problems of daily life, leading to an improvement in psychiatric symptoms, except horticulture that needs further studies, as the number of participants was low to generalize the results, besides the need of investigating the long-term effects (Table 1; Oha, et al., 2018).

Scientists also pointed out a proof of concept for Mismatch Negativity (MMN), a sensitive and predictive biomarker of perceptual learning, this study served as support for deeper studies, capable of affirming its action as a predictive biomarker for improving cognitive and psychosocial functioning (Table 1).

Table 1. Studies selected to the integrative literature review.

ARTICLE TITLE	OBJECTIVE	RESULTS
Physical activity and mental health in India: A narrative review.	This review aimed to assess the benefits of physical activity in common and severe mental disorders in the Indian context.	In educational institutions, defense institutes, and clinical settings, the Residential Yoga Program has achieved an improvement in its total feeling of mental well-being ($p < 0.001$) and a decrease in the state of anxiety ($p < 0, 01$). The results showed improvement in several psychological parameters, such as depression and better mental function after yoga practices (Cherubal, et al., 2019).
Effect of integrated yoga on anti-psychotic induced side effects and cognitive functions in patients suffering from schizophrenia.	Preliminary attempt to evaluate the effect of 5 months of Yoga intervention on side effects induced by antipsychotics, cognitive functions, positive and negative symptoms and anthropometric measures in patients with chronic schizophrenia.	This study suggests that Yoga intervention for 5 months may be useful in reducing drug-induced parkinsonism and other side effects induced by antipsychotics (Verma, et al., 2018)
Yoga as part of a package of care versus non-standard care for schizophrenia.	Assessing the effects of yoga as part of a care package versus nonstandard care for schizophrenia	In the absence of adequate trials in this area, it was not possible to perform any analysis, as there are no clinical trials on yoga as part of a package of care versus non-standardized care, therefore, making it impossible to comment on the quality of evidence in this area (Broderick & Vancampfort, 2017).
Yoga as part of a package of care versus non-standard care for schizophrenia.	The study analyzes whether yoga, offered as part of a larger care package, is effective for people with schizophrenia compared to standard care.	Results regarding mental, physical and social functioning, adverse effects and economic considerations, in this review, were not addressed. Minor changes in quality of life in favor of the yoga package have been observed, but there was insufficient good quality evidence in this review to make consistent claims that yoga as a care package should be prescribed as a complement to the standard treatment for schizophrenia. The schizophrenia is a long-term disease and larger, long-term trials that focus on important results are needed (Broderick & Vancampfort, 2019).
Yoga versus non-standard care for schizophrenia (review)	The study analyzed whether yoga is an effective complementary treatment compared to other complementary treatments for people with schizophrenia	For people with schizophrenia, at the moment, there is substantial evidence to determine whether yoga is more beneficial when compared to non-standard care packages that do not offer this modality. If yoga is offered, it should be clear that it is not known whether this intervention is useful or not when compared to other non-standard care interventions (Broderick & Vancampfort, 2019).
Effects of chair yoga therapy on physical fitness in patients with psychiatric disorders: A 12-week single-blind randomized controlled trial.	Assessing the effects of chair yoga therapy on physical fitness in psychiatric patients, to prevent the risk of falls.	The study detected in the chair yoga therapy group, significant improvements in flexibility, hand grip and muscular resistance of the lower limbs. The results indicated sustainable effects of 20-minute, 12-week, 24-hour chair yoga therapy on physical fitness contributing to reduce the risk of falls and

The Effect of Yoga on Functional Recovery Level in Schizophrenic Patients.	The aim of this study was to determine the effect of yoga on functional recovery in schizophrenic patients.	their unwanted consequences in psychiatric patients (Ikai, 2017).
Cognitive remediation in schizophrenia—The view from India.	Review Indian research on remediation in schizophrenia	In the study, the yoga caused an increase in the FROGS subscale and in the total average patient score in the experimental group. This result confirms the hypothesis "Yoga, applied to patients with schizophrenia increases their level of functional remission" (Kavak & Ekinci, 2016).
A randomised controlled trial of adjunctive yoga and adjunctive physical exercise training for cognitive dysfunction in schizophrenia.	This study assessed whether yoga training or exercise improves cognitive functions in schizophrenia to usual treatment (TAU)	Approaches such as: Cognitive correction (CR) in schizophrenia; Professional rehabilitation as a cognitive improvement; Yoga as a cognitive enhancement therapy; Unsupervised cognitive recycling at home; gain strength in India, with satisfactory results. However, other innovative approaches need to be tested (Deshpande, et al., 2016).
A heuristic model linking yoga philosophy and self reflection to examine underlying mechanisms of add-on yoga treatment in schizophrenia.	The aim of this study was to discuss the potential mechanism of yoga in the treatment of schizophrenia proposing a testable hypothesis for future empirical studies.	Significant improvements in various cognitive domains were observed in patients who participated in supervised yoga training (YT) or supervised physical training (PE) associated with usual treatment (TAU). Such improvements in YT and PE are seen when associated with TAU compared to TAU alone (Bhatia, et al., 2017).
Bridging the schism of schizophrenia through yoga—Review of putative mechanisms.	This study tried to integrate evidence from research based on neurosciences, which focus on the effects of yoga on neuroplasticity to achieve the connectopathy of schizophrenia.	There are results of preliminary studies that suggest improvement in schizophrenia symptoms when Yoga is practiced as a complement to antipsychotic medications. The study helped to propose a theoretical and heuristic model to examine the underlying mechanisms in schizophrenia (Rao & Menon, 2016).
Designing and validation of a yoga-based intervention for schizophrenia.	Develop and validate a specific generic yoga-based intervention module for patients with schizophrenia	Proposal for a putative mechanism to support the beneficial effects of yoga for deficits in social cognition and negative symptoms in schizophrenia (Mehta et al.2016).
Yoga as part of a package of care versus non-standard care for schizophrenia (review).	The aim was to examine the effects of yoga as part of a care package versus nonstandard care for schizophrenia	Ten yoga therapy research experts consented to do the content validation of yoga module. A text was developed as an intervention to target positive, negative and cognitive symptoms, as well as some side effects of medications in adults with schizophrenia. The final module has to be proven by clinical studies and, if effective, can represent a safe and well accepted therapeutic option in the treatment of schizophrenia, which can be used at the community level (Govindaraj, et al., 2016).
		It was not possible to find any randomized clinical trial that specifically compared yoga as part of a care package with non-standard care. The study came to the conclusion there is not enough evidence for the acceptability of these interventions for people with schizophrenia and no conclusions can be drawn from this review (Broderick & Vancampfort, 2019).

Acute Effects of Music Therapy in Subjects with Psychosis During Inpatient Treatment.	This study evaluated the effects of a structured music therapy program on patients with psychosis while admitted to an emergency psychiatric hospital	Even after a short period of hospitalization (less than four weeks), regardless of drug treatment, in hospitalized patients with severe mental disorders who attended a structured music therapy group, the researchers reported greater clinical and psychosocial improvements compared to those who did not attend to a group (Volpe, et al., 2018).
The effect of music on auditory hallucination and quality of life in schizophrenic patients: a randomised controlled trial.	The study was carried out to determine the effects of music on auditory hallucination and quality of life in schizophrenic patients	In this study, listening to music in the Rast tone had positive effects on the positive symptoms and quality of life of patients with auditory hallucinations. According to these results, it is recommended to individuals with schizophrenia listen to music in the Rast tone to deal with auditory hallucinations and maintain their quality of life (Pinar, et al., 2018).
Music therapy as a complementary form of therapy for mental disorders.	The article aims to discuss the mutual similarities between psychotherapy and music therapy	In the results, there is a lack of studies that can demonstrate the contribution of music therapy as a complementary treatment in mental disorders. The difficulty in evolving these studies is the lack of similar studies that prove the effectiveness of music therapy (Witusik, et al., 2019).
The Effect of Yoga on Functional Recovery Level in Schizophrenic Patients. The Effect of Yoga on Functional Recovery Level in Schizophrenic Patients.	The aim of this study was to identify the effects of relaxation exercises and music therapy on the psychological symptoms and depression in patients with chronic schizophrenia.	The results suggest that relaxation exercises and music therapy should be used to complement medication in the treatment of schizophrenia-related psychotic symptoms and depression (Kavak, et al., 2016).
Music therapy for people with schizophrenia and schizophrenia-like disorders.	The aim was to Analyze the effects of music therapy or music therapy added to standard treatment compared to placebo, standard treatment or no treatment for people with severe mental disorders such as schizophrenia	There is evidence that music therapy, as a complement to standard treatment, can help people with schizophrenia to improve their overall state and mental state (negative symptoms, depression and anxiety), functioning (general and social) and quality of life in a short and medium term. Music therapy seems to address especially motivational, emotional and relational aspects and helps patients to improve their activities and social roles. For this, the results of music therapy seem to depend on the number of music therapy sessions and, if they are regular sessions, the benefit remains (Geretsegger, et al., 2017).
Significant treatment effect of adjunct music therapy to standard treatment on the positive, negative, and mood symptoms of schizophrenic patients: a meta-analysis.	The aim of this study was to update the published data and explore the role of music therapy in adjunctive treatment in schizophrenia with a complete meta-analysis.	The meta-analysis of this study highlighted an effect of significant improvement in the treatment with Music Therapy in patients who received this therapy, in comparison to those who did not receive it, especially in those with a chronic course (Tseng, 2016).
A case study on acupuncture in the treatment of schizophrenia.	It examined whether acupuncture was useful as a complement to treat patients with schizophrenia.	After applying acupuncture therapy to a schizophrenic patient, it is concluded that this practice may be an adequate complement to the treatment in patients with chronic schizophrenia. Improvement in sleepiness and mood was observed. In addition, acupuncture can also alter the hallucinations themselves, because although they still occur, they were reduced in pain and suffering (Bosch, et al., 2015).

Effect of Community-Based Social Skills Training and Tai-Chi Exercise on Outcomes in Patients with Chronic Schizophrenia: A Randomized, One-Year Study.	The aim was to analyze the effect of antipsychotics combined with integrated community-based interventions (Tai-Chi) on schizophrenia outcomes	The results suggest integrated community-based interventions as social skills training and Tai-chi exercises are effective to improve outcomes in patients with chronic schizophrenia (Kang, et al., 2016).
Effectiveness of Traditional Chinese Medicine as an Adjunct Therapy for Refractory Schizophrenia: A Systematic Review and Meta-Analysis.	This study investigated the effectiveness of TCM in combination with antipsychotics for refractory schizophrenia	14 artigos foram estudados, dos quais cinco estudos incluídos avaliaram a eficácia do TCM sozinho versus antipsicóticos, e os nove restantes compararam os diferentes efeitos entre o TCM mais antipsicóticos e antipsicóticos. Essa meta-análise fornece uma consolidação de evidências sobre as vantagens potenciais da MTC como medicamento alternativo adequado para pacientes com esquizofrenia refratária (Wei, et al., 2018).
Traditional Chinese medicine for schizophrenia: A survey of randomized trials.	It aimed to analyze reports of randomized trials about traditional Chinese medicine (TCM) interventions for schizophrenia.	Acupuncture and exercise were the non-pharmacological interventions of TCM. Among the most commonly evaluated treatments are Ginkgo biloba, acupuncture, Wendan decoction and Shugan Jieyu capsule. As the TCM is a very broad concept, the article suggested more specific intervention terms should be adopted (Deng, et al., 2016).
Serum brain-derived neurotrophic factor levels associate with cognitive improvement in patients with schizophrenia treated with electroacupuncture.	Evaluating the effectiveness of electroacupuncture on clinical symptoms, cognitive function and level of brain-derived neurotrophic factor (BDNF) in patients with schizophrenia	Cognitive benefits of electroacupuncture treatment in patients with schizophrenia (Sun, et al., 2016).
Schizophrenia: Nutrition and Alternative Treatment Approaches.	It reported a variety of alternative and dietary treatments to manage this disease, in addition to its benefits.	Reports of gluten-free diets and others have made episodes much shorter and easier to manage, in addition to improving negative symptoms. With the orthomolecular approach, on the other hand, there was a reduction in anxiety and feelings of depression (Royal, 2016).
Use of a Gluten-Free Diet in Schizophrenia: A Systematic Review. American Society for Nutrition.	The study conducted a systematic review to determine whether a gluten-free diet (GFD) offers effective symptomatic relief for those suffering from schizophrenia.	Despite bias inherent in non-randomized studies and the publication, it appears that a GFD presents minimal risk in patients with schizophrenia and is a viable option in terms of adherence. This treatment can provide relief from the symptoms of schizophrenia, however more research is needed to examine the biomarkers of gluten sensitivity and inflammation (Levinta, et al., 2018).
Mindful exercise versus non-mindful exercise for schizophrenia: A systematic review and meta-analysis of randomized controlled trials.	It Investigated whether conscious exercise was more beneficial than unconscious exercise for people with schizophrenia	Seven studies pointed out significant differences in favor of conscious exercise of psychiatric symptoms. Pooled data from two or three studies showed a significant difference in favor of the intervention of conscious exercise in psychiatric symptoms. In this sense, conscious exercise was more beneficial than non-conscious exercise in some results of psychiatric symptoms and cognitive performance for schizophrenia (Li, et al., 2018).
An Exploration of a Dance Therapy Workshop Apparatus for Schizophrenics	Assessing the influence of dance workshop in a space prepared for schizophrenic patients.	Through the creation of a space thought in terms of psychic space of schizophrenic patients that represented a continuity between the psychiatric hospital and the outside world, the participants began to explore spaces not

Creative art therapy for mental illness.	Provide a narrative summary of findings on the use of Creative Art Therapy (CAT) for Serious Mental Illness (SMI): schizophrenia, trauma-related disorders, major depression and bipolar disorder.	yet explored. The silence of the voices was also observed, in addition to the vocation in the dance gesture (Lippi, et al., 2017).
Art therapy for people with psychosis: a narrative review of the literature.	The aim was to examine the effectiveness of art therapy for people with psychosis and explore whether this type of therapy is a meaningful and acceptable intervention.	The CAT regimen for all psychiatric disorders was neither practical nor advisable. Greater standardization of methods is needed to improve the assessment of CAT interventions to detect the best strategy for each mental illness (Chiang, et al., 2019).
Effect of an artificial therapy program called going beyond schizophrenia (GBTS) in inmates with schizophrenia in mainland China - a randomized, longitudinal, controlled study	Develop a structured and quantitative art brut therapy program called going beyond schizophrenia, with the aim of measuring the benefits of art therapy in prisoners in mainland China.	The evidence about the effectiveness of art therapy in reducing symptoms and functioning in people with psychosis remains inconclusive. Randomized clinical trials are needed (Attard, et al., 2016).
Assessment of the psychopathological effects of a horticultural therapy program in patients with schizophrenia.	The objective was to evaluate the psychopathological effects of participating in a 10-session horticultural therapy program in patients with schizophrenia	Despite the limitations of this article, quantitative data has been provided to support the benefits of art brut therapy in prison settings, as positive changes have been observed in inmate participants, and can be culturally adjusted to be applied to prisoners in other countries or other populations with schizophrenia (Qiu, et al., 2017).
Towards the recovery of a sense of self: An interpretative phenomenological analysis of patients' experience of body-oriented psychotherapy for schizophrenia.	Building theories and qualitatively explore the experience of participants in body-oriented psychotherapy (BPT) in schizophrenia	The therapy program had positive effects for patients with schizophrenia in terms of psychopathological symptoms. However, studies need to have a larger number of subjects to generalize the results and investigate the long-term effects of a horticultural therapy program for patients with schizophrenia and chronic symptoms (Oha, et al., 2018).
Schizophrenia: Impact of psychopathology, faith healers and psychoeducation on adherence to medications.	Investigate whether the dimensions of symptoms, post-discharge care plans and involvement with healers affect treatment adherence in patients with schizophrenia.	The qualitative nature of this study allows us to go in addition to a mere endorsement or rejection of BPT. A better understanding and further development of BPT in schizophrenia is needed (Galbusera, et al., 2017).
Interactional synchrony and negative symptoms: An outcome study of body-oriented psychotherapy for schizophrenia.	It aimed to evaluate the effectiveness of a manual body-oriented psychotherapy (BPT) intervention for schizophrenia, with a focus on improving negative symptoms and changes in interactional synchrony.	A significant association was observed between family involvement and partial adherence and between the involvement of the community team after discharge, together with total adherence to medications. Psychoeducation was a predictor of medication adherence, while involvement with healers predicted non-adherence (Aziz, et al., 2016).
Mindfulness interventions for psychosis: a systematic review	It aimed to provide a systematic review of the effectiveness of	Reductions in general psychiatric symptoms, which reflected improvement after therapy. There were also findings regarding significant improvement in negative symptoms. When examining the interactional synchrony in both interviews, after therapy there was a change in the interactional synchrony, with an improvement from the pre-therapy interview to the post-therapy interview (Galbusera, et al., 2016).
		The findings in this review suggest that there are good reasons to provide mindfulness approaches for people with psychosis in conjunction with

of the literature.

mindfulness treatments for individuals with psychosis.

currently recommended interventions (Aust, et al., 2017).

The effects of auditory hallucination symptom management programme for people with schizophrenia: a quasi-experimental design

The aim of this study was to compare the participants' levels of auditory hallucinations, anxiety and depression, before and after receiving routine treatment and participating in the auditory hallucinatory symptom management program (AHSM).

This study explored the effectiveness of the program in reducing emotional symptoms. The experimental group that participated in the AHSM program showed better improvement than the control group, indicating it is an effective strategy for patients who take medication regularly, but still suffer from auditory hallucinations. This program may have potential benefits for patients with schizophrenia with auditory hallucinations when applied in psychiatric rehabilitation centers (Yang, et al., 2015).

Mismatch Negativity is a Sensitive and Predictive Biomarker of Perceptual Learning During Auditory Cognitive Training in Schizophrenia.

It is a proof of concept to determine whether the negativity incompatibility (MMN), a potential index related to auditory sensory discrimination events associated with cognitive and psychosocial functioning, predicted gains in auditory perceptual learning and exhibited malleability after initial exposure to early stages of hearing. It also aims to determine whether MMN is a sensitive and early index of the neural systems involved in these exercises.

This proof of concept demonstrated MMN is an EEG biomarker with substantial theoretical and empirical links. It also proved to be a sensitive index of "target involvement" that predicts the initial response to training. This study provides support for a more in-depth study of MMN as a predictive biomarker for improving cognitive and psychosocial functioning (Perez, et al., 2017).

Research on the Effect of the Foot Bath and Foot Massage on Residual Schizophrenia Patients.

This article tried to determine whether bathing and foot massage can or cannot provide your subjective comfort. Also examined whether bathing and foot massage improve psychiatric symptoms and reduce the difficulties associated with psychiatric symptoms.

A feeling of security was observed with the baths and massages which helped the patients to overcome the division between mind and body. There is a possibility that physical care works directly on their vulnerable ego functions leading to schizophrenic symptoms recovery (Kito, et al., 2016).

Source: Authors.

4. Discussion

Schizophrenia patients often experience social isolation, PICS directed at this population can contribute to taking care of the state of great emotional and physical suffering, marked by fear of falling ill and insecurity (Bezerra, et al., 2020). After reading all the results, we noted it is important to stimulate the growth and development of research in order to promote a better quality of life and make the usual treatments more bearable to schizophrenic patients. In Brazil, probably due to the non-inclusion of PICs in professional training, many reports that they do not wish to work in this area (Andres, et al., 2020).

Several studies indicate Yoga as a complementary treatment, with reports of improvement in the symptoms and minimization of side effects induced by antipsychotics (Cherubal, et al., 2019). There are also reports about quality of life with small positive changes, but there are still no proven of this effect on clinical trials (Broderick, et al., 2017). Furthermore, the existing evidence suggests a greater benefit from this complementary practice when compared to other treatments that do not use Yoga. Thus, when offering this type of intervention, it should be clarified whether it will be useful or not when compared to other modalities (Verma, 2018).

There is an emphasis on research about Functional Remission of General schizophrenia scale (FROGS), confirming the hypothesis that yoga applied to schizophrenic patients increases the level of functional remission. In addition, the supervised yoga training associated with habitual treatments, reveal significant improvements in several cognitive domains. Therefore, there was a proposal for a putative mechanism to support the beneficial effects of yoga for deficits in social cognition and negative symptoms in schizophrenia, because the persistence of cognitive deficits and negative symptoms is reported, even with the use of conventional antipsychotic drugs (Kavak & Ekinici, 2016).

Preliminary evidence treats the effectiveness of yoga as a complementary treatment in schizophrenia, but more research is needed to understand the mechanism by which yoga improves the symptoms of this disease. There are also reports of improved self-reflection in schizophrenic patients, highlighting that this intervention is economically and culturally acceptable, thus encouraging further research (Deshpande, et al., 2016).

Regarding the implementation of protocols, a study reports that India has difficulties in implementing protocols from developed countries as there are several ethnic groups, cultural practices and, mainly, a shortage of mental health professionals. Another study used ten specialists in yoga therapy research, to validate a content of yoga module and a text was

developed to address positive, negative and cognitive symptoms, as well as side effects of drugs in adults with schizophrenia. However, it must still be proven by clinical studies, and, if effective, it may represent a safe and acceptable therapeutic option to assist conventional treatments of this disease (Cherubal, et al., 2019).

Music therapy showed important results in articles that evaluated this strategy as an alternative for patients with schizophrenia (Table 1). It is important to note that practices related to music therapy are indicated as complementary to the pharmacological treatment of these patients (Volpe, 2018). However, some authors associate a dependence between the effects of this practice and the number of music therapy sessions to achieve the benefit in the treatment (Volpe, 2018; Pinar & Tel, 2018). There is still a lack of studies to demonstrate the real contribution of music therapy as a complementary treatment in schizophrenia, this scarcity may contribute to the difficulties in the development of studies in this field to strongly prove the effectiveness of music therapy (Witusik & Pietras, 2019).

The results showed Traditional Chinese Medicine (TCM) presents several pharmacological interventions, not only acupuncture, but other measures based on the search for patients' well-being (Deng & Adam, 2016). Therefore, this term TCM is quite broad, since there were a large number of measures evaluated, demonstrating the researchers' interest in this practice. However, in these evaluations we observed a need for organization among financiers, government and corporate professionals. For a better term for referring to the TCM used in schizophrenia, further research is needed to identify the best approach with patients who benefit from the positive effects of these practices (Bosch, et al., 2015; Deng & Adam, 2016; Kang, et al., 2016). In addition, there is also consolidated evidence on the potential advantages of TCM as an alternative drug suitable for refractory schizophrenia (Bosch, et al., 2015; Kang, et al., 2016).

Other articles point to acupuncture and Tai-Chi as appropriate supplements for the treatment of chronic schizophrenia, with effects on improving psychological well-being, mood and drowsiness and cognitive benefits (Bosch, et al., 2015; Kang, et al., 2016). The practice of electroacupuncture on cognitive function also showed significant differences over time but the opposite on clinical symptoms, which did not produce significant effects (Sun, et al., 2016; Witusik & Pietras, 2019).

Regarding nutrition, a Gluten Free Diet (GFD) presents minimal risk in patients with schizophrenia and is a viable option in terms of adherence (Royal, 2016). In addition, this treatment can provide symptom relief in up to a quarter of patients (positive for) affected by this disorder. More research is needed to examine biomarkers of gluten sensitivity and

inflammation in order to effectively target patients with schizophrenia. Furthermore, other neuropsychiatric disorders commonly seen in patients with gluten sensitivity include autism, spectrum and mood disorders (Royal, 2016; Levinta, et al., 2018).

Regarding physical exercise, conscious exercise has been more beneficial than non-conscious exercise in some results of psychiatric symptoms and cognitive performance for schizophrenia. In this context, although conscious exercise may be more economical or less physically demanding, there is currently insufficient evidence to determine whether the effect of conscious exercise is more beneficial than unconscious exercise for people with schizophrenia. Therefore, future work is needed to increase the bases of long-term conscious and non-conscious exercises, with greater methodological quality in this area (Li, et al., 2018).

The dance workshop covered in this review, makes us recognize the importance of setting the schizophrenic patient in terms of the psychiatric hospital environment, in order to stimulate their participation in this practice, through a conceptualization of space. The dance, free from the limits inherent to speech, allows the body to express itself both in dissociation and in continuity with others in a shared space. Dance serves as a privileged artifice in which to reconstruct a unit based on the specific multiplicity that characterizes the movement and trajectories of the body. Thus, this unity does not cancel the multiplicity that breaks out in the body while dancing, nor does it cancel the multiplicity of psychosis. As we have seen, the dance is not an attempt to reduce or contain the real that haunts the psychotic, but to provide an environment that encourages its expression and to use it in inventive and unexpected ways, in relation to the subject and the subject's desire (Lippi & Petit, 2017).

After reading the articles related to art therapy, there were reports of caution in using Creative Art Therapy (CAT) for all psychiatric disorders, which is neither practical nor advisable. We identified the need for a greater standardization of the applicability of art therapy, which will promote a better assessment of this type of intervention, for detecting the best strategy according to the patient (Chiang, et al., 2019).

When addressing psychotherapy, the exploratory nature of this study must be recognized, as it focuses on useful aspects of body-oriented psychotherapy (BPT) and left out other aspects as difficulties inherent to the implementation of therapy to different patients and psychiatric cases (Galbusera, et al., 2016; Galbusera, et al., 2017). However, a more detailed description of these aspects would be necessary for a better understanding of BPT (Galbusera, et al., 2017). More detailed information about the participants, especially regarding medications and level of functioning, would also have been useful to situate and better

understand the findings. Unfortunately, due to the nature of this pilot being exploratory, this information was incomplete or absent, not allowing greater reliability (Galbusera, et al., 2016; Galbusera, et al., 2017). We hope these considerations can inform and improve further research on the topic (Galbusera, et al., 2017).

In addition, many patients suffering from psychosis do not adhere to their medications. Non-adherence can vary from treatment refusal to irregular use or partial change in daily doses of medication. This study sought to investigate how symptom dimensions, post-discharge care plans and involvement with the healer affect treatment adherence in patients with schizophrenia. Evidence from this study suggests there is no simple relationship between medication adherence and sociodemographic variables. The interaction of symptom dimensions, the type of professional interventions and sociocultural factors (including involvement with healers) are important topics for future research (Aziz, et al., 2016).

The evidence of benefits from mindfulness practices is reasonable when combined with group therapy with mindfulness, in which the results were superior to the therapy performed individually. The improvement in psychological quality of life with improvement of negative symptoms in patients with psychosis is highlighted. Therefore, social support can be considered a beneficial tool associated with conventional treatment (Aust & Bradshaw, 2017).

In the case of auditory hallucinations, when analyzing the effects of the auditory hallucination symptom management program (AHSM), this study explored the reduction of emotional symptoms, in which those who participated showed a better improvement than those who did not participate, despite relief of auditory symptoms was detected in both participating groups. However, this fact was associated with the drug's stabilizing effects. Moreover, the assessment of depressive symptoms was carried out for 3 months, and after that period, an improvement in depression was detected. Thus, this program may also represent an effective strategy for individual patients who use the medication regularly, but still show symptoms of auditory hallucinations (Yang, et al., 2015).

In conclusion to Mismatch Negativity (MMN), this proof-of-concept study demonstrates the present results can accelerate future trials designed to use biomarkers to predict and monitor responses in a complete hearing training course (Perez, et al., 2017).

We point out here other important measures are being researched to improve the pharmacological treatments of patients with schizophrenia. Research on the effect of bathing and foot massage in patients with residual schizophrenia allows us to conclude that patients felt a sense of security with baths and massages, helping in the separation between body and

mind. This contributes to reduce symptoms, as body care reflects feelings of pleasure in the ego (Kito & Suzuki, 2016).

5. Conclusion

Studies using complementary therapies for the treatment of schizophrenia are advancing in their results. Currently, new therapies are being studied, in addition to research efforts to prove the effectiveness of these interventions. Care protocols and other forms of interventions have shown positive results in reducing the symptoms of schizophrenia. Furthermore, researches related to yoga, music therapy, Traditional Chinese Medicine, body-oriented exercises and psychotherapy have stood out as complementary strategies for schizophrenia, contributing to the search and proof of these results that help schizophrenic patients in coping with treatment. Therefore, this study serves as an incentive for the continuous advance of researches related to strategies to minimize complications both in schizophrenia and in its treatment.

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