



**ARTÍCULO ORIGINAL**

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## **RUMINATIVE THINKING STYLE AND ITS IMPACT IN PATIENTS WITH PSYCHOSIS: A SYSTEMATIC REVIEW**

### **ESTILO DE PENSAMIENTO RUMINATIVO Y SU IMPACTO EN PACIENTES CON PSICOSIS: UNA REVISIÓN SISTEMÁTICA**

Luciana Díaz-Cutraró<sup>1</sup>, Daniela Perez-Vasaro<sup>2</sup>, Demián Rodante<sup>3</sup>, Eduardo Keegan<sup>4</sup>, Susana Ochoa<sup>5</sup>

<sup>1</sup>Clinical Psychologist. AREA (Assistance and Research in Mood Disorders). UBA (Faculty of Psychology, University of Buenos Aires). Argentina. <sup>2</sup>Clinical Psychologist. Mental Health Day Hospital of the General Hospital E. Tornú. Argentina. <sup>3</sup>Psychiatrist. FORO Foundation, UBA (Faculty of Medicine of the University of Buenos Aires). Argentina. <sup>4</sup>Doctor and Professor in Psychology. UBA (Faculty of Psychology, University of Buenos Aires). Argentina.

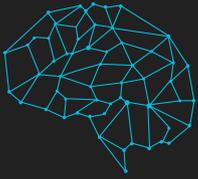
<sup>5</sup>Doctor in Psychology. Unitat de Recerca of the Parc Sanitari Sant Joan de Deu, Barcelona, Spain. CIBERSAM

**Correspondencia:** Luciana Díaz Cutraró, Juncal 2061 PB C, Ciudad Autónoma de Buenos Aires.



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## ABSTRACT

Rumination is a transdiagnostic strategy of emotional regulation. It has been widely studied in depressive disorders but little is known about its role in psychosis. In the present article we carry out a systematic review to study the link of rumination with psychosis. The results indicate that rumination, as dysfunctional processing of information, is linked to psychotic symptoms such as delusional and negative symptomatology and problems such as insomnia.

**Key words:** Rumination, emotional regulation, transdiagnostic mechanisms, psychosis, psychotic symptoms.

## RESUMEN

La rumiación es una estrategia transdiagnóstica de regulación emocional. Se ha estudiado ampliamente en trastornos depresivos, pero se sabe poco sobre su papel en la psicosis. En el presente artículo llevamos a cabo una revisión sistemática para estudiar el vínculo de la rumiación con la psicosis. Los resultados indican que la rumiación, como el procesamiento disfuncional de la información, estaría relacionada con síntomas psicóticos tales como la sintomatología delirante, la sintomatología de la serie negativa y problemas generales tales como el insomnio.

**Palabras clave:** Rumiación, regulación emocional, mecanismos transdiagnósticos, psicosis, síntomas psicóticos.

## INTRODUCTION

Rumination is a non-functional strategy for coping with negative moods that implies self-centered attention<sup>1</sup>. It is characterized by referring to negative mood antecedents, being passive because it does not address a certain objective, nor is there a plan to correct it, and by tending toward social isolation. In turn, it makes problem-solving difficult and interferes with the individual's activity<sup>2</sup>. Rumination is associated with dysphoric mood states<sup>3</sup>, and an increase in depressive symptomatology<sup>4</sup>, contributing to the severity and maintenance of the depressive disorder<sup>5-8</sup>.

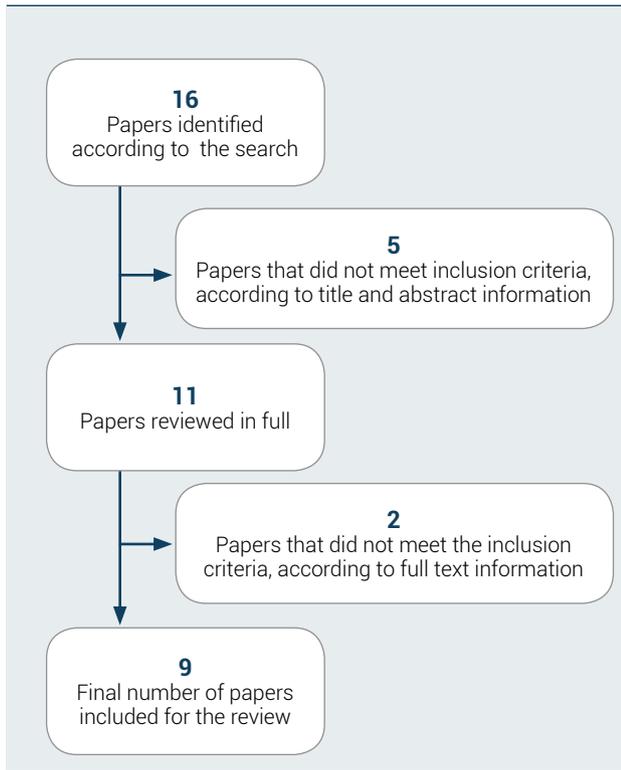
The concept of Emotional Regulation (ER) involves a series of voluntary and involuntary processes used to modulate the occurrence, intensity, and duration of internal states that occur in response to external events and, optimally, according to the goals of each person<sup>9,10</sup>. Common strategies for self-regulation include attempts to actively suppress emotional behaviors and physiological responses (such as rumination or

anticipation) and to cognitively control the type and extent of emotional responses through techniques to re-frame the meaning of events (such as cognitive reassessment and attentional refocus)<sup>9,11</sup>.

Numerous studies have examined the role of rumination in anxiety and depression<sup>12-14</sup>. However, to date, rumination has not been studied exhaustively in a population with psychosis. The present work proposes to carry out a systematic review and a conceptual analysis of the literature available nationally and internationally, in order to learn the state of the art on the role of rumination as a mechanism of regulation in psychosis, and the transportability of this knowledge to clinical practice and psychotherapeutic interventions.

## MATERIALS AND METHODS

A systematic review was carried out of the works published in relation to the ruminative thinking style in adult



**Figura 1.** Flow diagram for the identification process of articles included.

patients (between 19 and 65 years old) with psychosis between January of 2009 and February of 2019 in the Medline database. The search strategy was carried out, using the Pubmed search engine, with the following terms:

#1. rumination OR #2. rumination, cognitive AND #3. psychosis"

All the results were examined by all the members of the research group (Fig. 1). The inclusion criteria were the following: published in English; availability of abstracts; type of studies including case-control, cohorts, prospective, reviews and meta-analyses; patients diagnosed with pathologies of the psychotic spectrum.

Data extraction: When searching, a total of 16 articles were found, of which 7 were excluded because they did not meet the inclusion criteria. A total of 11 were reviewed in full text. Finally, 9 articles were identified as relevant as shown in the flow chart of figure 1.

## RESULTS

### DELUSIONAL SYMPTOMATOLOGY AND RUMINATION

Of the articles included in the review, five explored the relationship between delusional or paranoid symptoms and rumination<sup>15-18</sup>.

S. Hartley et al.<sup>15</sup> used the experience sampling methodology (ESM) to assess, in 27 participants with psychosis, the momentary links between worry and rumination, and persecutory delusional ideation and auditory hallucinations. The results show that antecedent worry and rumination predicted delusional and hallucinatory experience, and the distress they elicited. The links with the severity of the momentary symptoms were moderated by the participants' metacognition (beliefs about negatively thinking) regarding thinking processes such as concern/rumination.

E. Cernis et al.<sup>16</sup> conducted a comparative study that included 142 patients with persecutory delusions and a non-clinical group made up of 273 volunteers. They evaluated the relationship between worry and paranoia in both samples. The patients with persecutory delusions were shown to have significantly higher levels of ruminative negative thinking than the non-clinical group.

Likewise, Clara Marie Nittel et al. carried out a comparative study in which they recruited 32 patients with psychotic disorders. The whole sample had higher levels of instability in the management of negative emotions, greater use of rumination, expressive suppression, and more severe levels of paranoia state (depending on the time of the evaluation).

The study of Tania M. Lincoln et al.<sup>18</sup> explored the relationship between dysfunctional emotional regulation and socio-environmental stressors in individuals at clinical high risk of psychosis (CHR). They conducted a comparative study that included 25 patients with CHR (with a significantly greater increase in paranoid beliefs) and 2 groups of controls (40 patients with anxiety disorders and 40 healthy controls). People with CHR responded with paranoid symptoms to stressful events more than controls, correlating with greater use of maladaptive strategies of ER (including rumination).

Finally, Ashley McKie, Kristina Askew, and Robert Dudley<sup>19</sup> studied the role of rumination and self-centered care in 32 non-clinical participants engaged in a paranoia induction prime who then took part in an eight-minute ruminative self-focus induction and an eight-minute mindful self-focus induction. They found that following an induction of paranoia,



mindful self-focus produced significantly decreased levels of paranoia, whereas ruminative self-focus had no significant impact on levels of paranoia, and therefore was interpreted as having maintained paranoia.

## NEGATIVE SYMPTOMS AND RUMINATION

Only one article evaluated the relationship between rumination and negative symptoms. Halari et al.<sup>20</sup> evaluated 37 outpatients with psychosis. Their findings showed that emotional withdrawal and stereotyped thinking styles were associated with rumination in patients with psychosis<sup>20</sup>. Affective blunting was associated with difficulties in amplifying (in the pursuit of regulation) emotional expression and not with the excessive use of suppression<sup>21,22</sup>. These findings highlight the potential importance of understanding the interaction between ER strategies and negative symptoms<sup>20</sup>.

## DELUSIONAL SYMPTOMATOLOGY, RUMINATION, AND DEPRESSION

One study examined the relationship between depression and the cognitive factors that influence the maintaining of persecutory delusions in psychosis. The cross-sectional study by Vorontsova et al.<sup>23</sup> showed that 50% of patients with persecutory delusions met diagnostic criteria for major depression. Cognitive processes such as rumination were found to be associated with depression. The severity of initial depression in patients with persecutory delusions predicted the persistence of paranoia over a period of six months.

## RUMINATION AND INSOMNIA

Only the study of Vivian W. Chiu, B Psych et al.<sup>24</sup> explored the relationship between rumination and paranoia. The researchers recruited 55 psychiatric inpatients and 66 healthy controls, of whom 25 in each group met criteria for insomnia. Both insomnia groups demonstrated night-time rumination, aggressive suppression as a thought control strategy, and exaggerated views regarding the health consequences of poor sleep. In addition, the psychiatric group with insomnia frequently reported the causes of insomnia to be related to their illness (rather than to their lifestyle factors) and had an incomplete understanding of good sleep habits.

## EVALUATION OF RUMINATION IN PSYCHOSIS.

Cognitive Attentional Syndrome (CAS) plays a central role in psychological disorders and prolonged negative affect, and

has been defined as a collection of unhelpful metacognitive coping strategies characterized by worry, rumination, threat monitoring, and attempts to control thoughts. In a comparative study by Sellers et al.<sup>25</sup>, the validity of the CAS in clinical psychosis was tested in a sample composed of 60 participants (of whom 48 had active psychotic symptoms as defined by scores on hallucinations, delusional beliefs, or paranoid ideation) versus a non-clinical sample of 60 people. The CAS-1 (a questionnaire designed to detect CAS) demonstrated good internal consistency, concurrent validity, and predictive validity. Comparisons of CAS-1 scores between the psychosis sample and a sample of people with no psychiatric diagnosis demonstrated the discriminant validity of the scale. As hypothesized, the clinical sample had significantly higher processing, beliefs, and total scores. Hierarchical multiple regression analyses revealed that negative metacognitive beliefs relating to the uncontrollability of thoughts were unique predictors of negative affect, perceptions of recovery, and quality of life in people with psychosis when psychotic symptoms were controlled for. This finding suggests that unhelpful thinking styles are a stronger determinant of self-reported recovery and fulfilment than psychiatric symptoms themselves.

## DISCUSSION

Rumination is a coping strategy against negative moods<sup>7,8</sup>; ER refers to "the active attempts of people to manage their emotional states"<sup>26</sup>. Several ER strategies are available to increase, maintain, or decrease positive and negative emotions<sup>27</sup>. It is important to highlight the importance of considering these specific findings in order to design psychotherapeutic strategies according to what the target population requires, taking into account from the outset that people with psychosis can show significant alterations in the experience, expression, and perception of the emotion<sup>28</sup>.

Emotional dysregulation in patients with can manifest itself in multiple ways. Delusional persecutory symptomatology may be one of them. The patients with persecutory delusions were shown to have significantly higher levels of ruminative negative thinking than the general population sample<sup>16</sup>. In the same line, antecedent worry and rumination predicted delusional and hallucinatory experiences, with metacognition being a possible explanation for symptomatic severity<sup>15</sup>. Moreover, these findings were in individuals at Clinical



**Table I.**

STUDY	AUTHORS	COUNTRY	YEAR	AGE (SD)	SAMPLE POPULATION	PSYCHOTIC DISORDER DIAGNOSES	MEASURES	METHODS	KEY PREVALENT FINDINGS
"Rumination and Negative Symptoms in Schizophrenia."	R. Halari and collaborators	UK	2009	39.25	37 outpatients with psychosis	DSM-4 criteria for diagnosis of schizophrenia or schizoaffective disorder.	PANSS, BDI-II, RSQ, Structured Clinical Interview for Major Depressive disorder (First et al., 1995)	Association of variables, logistics regression analysis.	Negative symptoms, especially emotional withdrawal and stereotyped thinking, but not depressive symptomatology, were associated with rumination in the present sample of patients with schizophrenia.
"Cognitive Factors Maintaining Persecutory Delusions in Psychosis: The Contribution of Depression."	N. Vrontsova and collaborators	UK	2013	PD: 40.1, PD + D: 42.8, D: 42.5, NC: 40.4	60 patients with persecutory delusions in the context of a schizophrenia spectrum diagnosis, 30 patients with depression, and 30 non-clinical controls.	SCAN (v2.1; World Health Organization, 1998), ICD-10 for diagnostic criteria for a current major depressive episode.	PSYRATS, GPTS, BDI, BAI, BCSS, AAQ, RRS, PSWQ, AMT, MEPS, WTAR.	Cross-sectional analysis, longitudinal	Depression is common in patients with current persecutory delusions, and it shows similar cognitive features to major depressive disorder. Depression and related processes may contribute to the maintenance of paranoia.
"An experience sampling study of worry and rumination in psychosis"	S. Hartley and collaborators	UK	2013	Mean:33, SD: 10.7	27 participant with psychosis. The most prevalent diagnosis was schizophrenia (n=15) but participants also met criteria for psychotic disorder not otherwise specified (n=14; eight of whom were noted as first episode), schizo-affective disorder (n=2) and acute psychotic disorder (n=1).	DSM-4 (American Psychiatric Association, 2000) for psychotic disorders	PANSS, PSYRATS, Negative Beliefs about Rumination Scale (NBRSS), Meta-Worry Questionnaire (MWQ; Wells, 2005)	Experience sampling methodology (ESM)	Antecedent worry and rumination predicted delusional and hallucinatory experience, and the distress they elicited. The links with momentary symptom severity were moderated by participants' trait beliefs about worry/ rumination, such that they were reduced when negative beliefs about worry/ rumination (meta-cognitions) were high.



Table I. Continue

STUDY	AUTHORS	COUNTRY	YEAR	AGE (SD)	SAMPLE POPULATION	PSYCHOTIC DISORDER DIAGNOSES	MEASURES	METHODS	KEY PREVALENT FINDINGS
"Cognitive and behavioral factors associated with insomnia in inpatients with schizophrenia and related disorders."	V. W. Chiu and collaborators	AUS	2015	Psychiatric group with insomnia; 39.76 ± 12.98 Psychiatric group without insomnia; 39.33 ± 12.84 Community controls with insomnia; 25.64 ± 10.59 Community controls without insomnia; 28.07 ± 15.15	55 psychiatric inpatients and 66 healthy controls; 25 with insomnia in both groups.	Unspecified diagnostic methodology. Clinical diagnoses were schizophrenia (n = 36), schizoaffective disorder (n = 6), bipolar disorder (n = 3), and other disorders with psychotic features (personality, n = 3; acute stress reaction, n = 2; neurodevelopmental disorder, n = 1; drug-induced, n = 3; unknown, n = 1).	Insomnia Severity Index, Thought Control Questionnaire for Insomnia-Revised, Dysfunctional Beliefs and Attitudes about Sleep scale, Sleep Hygiene Knowledge scale, and Beliefs about Causes of Sleep Problems questionnaires.	Cross-sectional study	Both insomnia groups demonstrated night-time rumination, aggressive suppression as a thought control strategy, and exaggerated views regarding the health consequences of poor sleep. The psychiatric group with insomnia reported the causes of insomnia to be related to their illness and had an incomplete understanding of good sleep habits.
"The Perseverative Thinking Questionnaire in patients with persecutory delusions"	E. Cernis and collaborators	UK	2015	Clinical: M: 41.5, SD: 11.4; Non-Clinical: M: 40.1, SD: 15.4.	142 patients with persecutory delusions and non-clinical group was made up of 273 volunteers from the general population.	Unspecified diagnostic methodology. Schizophrenia (N: 104), Schizoaffective Disorder (N: 11), Delusional disorder (N: 9), Psychosis NOS (N: 18)	PTQ (Ehring et al., 2011), PSWQ (Meyer et al., 1990), GPTS (Green et al., 2008).	Observational study exploring PTQ (also completed measures of worry and paranoia). A confirmatory factor analysis was performed on the clinical group's PTQ responses to assess the factor structure of the measure. Differences between groups were used to assess criterion reliability.	Patients with persecutory delusions were shown to experience significantly higher levels of ruminative negative thinking on the PTQ than the general population sample, lending support to the validity of the PTQ as a measure of negative ruminative thinking in patients with psychosis.



**Table I. Continue**

STUDY	AUTHORS	COUNTRY	YEAR	AGE (SD)	SAMPLE POPULATION	PSYCHOTIC DISORDER DIAGNOSES	MEASURES	METHODS	KEY PREVALENT FINDINGS
"An experimental investigation into the role of ruminative and mindful self-focus in non-clinical paranoia."	A. McKie and collaborators	UK	2017	Mean: 19.25, SD:1.22	32 non-clinical participants.	Non-clinical population with some modest level of paranoid ideation, and/or current mental health problems.	GPTS (Green et al. (2008), VASS, NA.	A quasi-experimental study was done. Thirty-two non-clinical participants engaged in a paranoia induction prime and then took part in an eight-minute ruminative self-focus induction and an eight-minute mindful self-focus induction.	Following an induction of paranoia, mindful self-focus significantly decreased levels of paranoia, whereas ruminative self-focus had no significant impact on levels of paranoia, and therefore was interpreted as having maintained paranoia.
"Do people with psychosis engage in unhelpful meta-cognitive coping strategies? A test of the validity of the Cognitive Attentional Syndrome (CAS) in a clinical sample."	R. Sellers and collaborators	UK	2017	M (SD): 34.78	60 participants: 48 had active psychotic symptoms defined as a >= 4 on hallucinations or delusional beliefs or a >= 5 on paranoid ideation using the Positive and Negative Syndrome Scale. The non-clinical sample consisted of 60 people.	DSM-4 for psychotic disorders	PANSS, CAS-1, MCQ-30, HADS, QPR, WHOQOL	Cross-sectional design. A semi-structured interview and self-report questionnaires were administered at a single time point.	The CAS-1 demonstrated good internal consistency, concurrent validity and predictive validity. Hierarchical multiple regression analyses revealed that negative metacognitive beliefs predict negative affect, perceptions of recovery and quality of life in people with psychosis over and above psychotic symptoms. CAS-1 scores did not contribute additional variance in the final regression models.



Table I. Continue

STUDY	AUTHORS	COUNTRY	YEAR	AGE (SD)	SAMPLE POPULATION	PSYCHOTIC DISORDER DIAGNOSES	MEASURES	METHODS	KEY PREVALENT FINDINGS
"The Relevance of Emotion Regulation in Explaining Why Social Exclusion Triggers Paranoia in Individuals at Clinical High Risk of Psychosis"	T. M. Lincoln and collaborators	Germany	2017	High-Risk for psychosis= 34.72, Healthy controls= 40.03, Anxiety disorder controls= 42.23	25 participants fulfilling criteria for clinical high risk of psychosis, 40 controls with anxiety disorders and 40 healthy controls.	All CHR (n = 25) fulfilled criteria for at least 1 of 3 prodromal syndromes: -72% SIPS criteria for the "Attenuated Positive Symptom syndrome" - 8%2 criteria for the "Genetic Risk and Deterioration syndrome" -- -16% criteria for both of these syndromes. The HC comprised 40 participants.	Psychopathology: SIPS, GAF, SOPS; Emotion regulation: CERQ; Paranoid beliefs: The frequency subscale of the German version of the Paranoia Checklist; Negative Emotion: unspecified scale	Comparative study	Patients with first psychotic episodes showed a significantly greater increase in paranoid beliefs than control groups. This would be linked to higher levels of dysfunctional emotional regulation and the presence of negative emotions. People with first episodes would respond with paranoid symptoms to stressful events rather than controls, correlating with greater use of maladaptive strategies of emotional regulation (including rumination).
"Expressive suppression is associated with state paranoia in psychosis: An experience sampling study on the association between adaptive and maladaptive emotion regulation strategies and paranoia."	C.M. Nitel and collaborators	Germany and Switzerland	2018	Mean: 35.87, SD: 11.05.	32 patients with psychotic disorders. Half of the sample was recruited in the pre-treatment phase of an outpatient treatment project (n = 16), additional outpatients (n = 16) were recruited via leaflets in public places.	Schizophrenia (n = 23), schizoaffective disorder (n = 7), schizotypal personality disorder (n = 1), and delusional disorder (n = 1) according to the DSM 5	PANSS, Paranoia Checklist (PCL; Freeman et al., 2005), Verbal intelligence. Experience sampling method was used to measure state paranoia, negative emotions, emotional instability and emotion regulation strategies.	Participants with psychosis (n = 32) reported repeatedly over six consecutive days on the presence and instability of positive and negative emotions, their use of adaptive (reappraisal, acceptance, distraction, social sharing, reflection) and maladaptive ER strategies (rumination, expressive suppression) and momentary paranoia in their daily life.	Patients with psychosis who presented pronounced instability of negative emotions showed more severe levels of state paranoia. In addition, patients with psychosis who used expressive suppression when confronted with negative emotions at one point in time presented more pronounced levels of state paranoia at the following point in time. Contrary to study hypotheses, the use of the maladaptive strategy rumination at one time was not associated with state paranoia at the next point in time.



High Risk of Psychosis (CHR)<sup>18</sup> using maladaptive strategies of ER (as rumination) in response to stressful events. Considering these results, we found strong evidence to support the metacognitive training for psychosis designed by Moritz et al.<sup>29-31</sup> where we work through different modules. These thought processes involve both acute moments of psychosis and comorbid problems.

Another way to understand emotional dysregulation in psychosis is through negative symptoms. Regarding negative symptoms, when patients chew the cud, the non-affective symptoms and other perceived problems are incorporated into the negative thinking of the person, with a prominent place beside those related to the social disability that the disease entails<sup>20-22</sup>. As we mentioned in Results, the severity of initial depression in patients with persecutory delusions predicted the persistence of paranoia over a period of six months. The high prevalence of depressive symptoms in schizophrenia, and in particular, their negative impact on prognosis, make detection a basic tool for diagnosis and treatment<sup>33</sup>, with comorbidity understood more as a rule than as an exception. Third-generation psychotherapeutic strategies suggest a promising future that we will have to continue evaluating<sup>34</sup>. In this line, for example, behavioral activation (BA) has well-established efficacy in the treatment of depression<sup>35,36</sup>. There are no controlled trials for people with depression and psychosis, although Waller et al. (2014) reported a series of encouraging cases<sup>37</sup>. Along the same line, a pilot study yielded results that suggest that intervention based on compassion, acceptance, and full consciousness is feasible, and is associated with a great increase in self-regulation of negative emotions (self-blame, rumination and catastrophism) and a decrease in psychological symptoms (anxiety, depression, somatic concerns, and improvements in self-care)<sup>34</sup>.

Additionally, our results suggest that rumination is linked with insomnia, as it is increased in people with problems sleeping. Moreover, these problems are greater in people with psychosis due to the difficulty in relating the two problems. So, appropriate treatment of insomnia in people with psychosis could be of interest in the prevention of relapses and the severity of the illness<sup>38</sup>. As suggested by Roberston et al. (2019), Cognitive Behavioural Therapy may be useful in reducing insomnia problems in people with schizophrenia.

In countries that have resources and the possibility of investing in mental health technologies, the use of virtual reality can be a key variable in the understanding of psychosis

and social environments, providing interesting applications in research and treatment<sup>39</sup>. Freeman highlights possible uses of this technology: the evaluation of symptoms, identification of symptom markers, establishment of predictive factors, analysis of causal factors, investigation of the differential prediction of symptoms, determination of elements toxic in the environment, and development of the treatment<sup>39</sup>. In pursuing further research, interventions that reduce rumination and rigid thinking may be useful in reducing other negative symptoms of psychosis<sup>20</sup>. In this line, O' Driscoll, Laing and Mason<sup>40</sup> consider that interventions that target the tendency to ruminate may be effective in preventing the transition to psychosis.

## LIMITATIONS

This work presents numerous limitations. First, only studies indexed in the Pubmed database were included, and a publication bias could not be avoided. Other databases should be explored in the future in order to assure the quality of the present review. In the same vein, the search for gray literature has not been exhaustive, and no contact was made with experts on the subject for suggestions on the inclusion of articles that were not found in the search result. Finally, a quality study of the included studies was not carried out. Such a study might have included, by way of example, quality assessment instruments such as the STROBE test (Strengthening the Reporting of Observational Studies in Epidemiology)<sup>41</sup>.

## CONFLICT OF INTERESTS

The authors have declared that there are no conflicts of interest in relation to the subject of the study.

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