

Psychosis: between Dreams and Perceptual Reality

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Abstract: *From the beginning of time, the layman always described and understood psychosis as a dream-like state. Researchers have characterized both psy-chosis and dreaming with common denominators, both displaying visuo-motor hallucinations, loose associations, metacognitive deficit, impaired reality discrimination, strong emotional component, resulting in a general lack of insight.*

The association of psychosis with dreaming was present in literature centuries ago, in the works of great thinkers such as Kant and Schopenhauer, which prompted many modern specialists to delve deeper into studying this connection for a better understanding of psychosis and possible applications in the clinical practice. During REM sleep, which is the most associated with dreaming, visual and motor areas in the brain show increased activation, which is congruent with the presence of hallucinations, the hallmark of the dreaming state. Also, the amygdala, involved in emotion regulation, has a prominent role in the sleeping brain. The deactivation of parts of the prefrontal cortex translate in altered capacity for making decisions and critical thinking. Several neuroimaging studies have shown similar neural patterns in the wakeful state of psychotic patients, especially those associated with the presence or absence of insight.

As insight is thought to play a major role in treatment compliance and quality of life in psychotic patients, it is the most studied element linking psychosis and REM sleep. Lucid dreaming is a state of awareness of dreaming, while the individual is still asleep. The dreamer has a degree of control of the narrative and capacity for self-reflection, aspects deemed as insight. Lucid dreaming is a rare occurrence, but has the potential to be trained, concept with great relevance in researching modalities for insight gain in psychotic patients.

In conclusion, the research of insight present in lucid dreaming shows great prospect for developing better interventions that target the lack of it in psychotic patients, thus contributing to significant improvement in their prognosis, quality of life and treatment compliance.

Keywords: *psychosis; dreaming; REM sleep; lucid dreaming.*

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Introduction

The term *psychosis* has been defined in countless ways in literature, presenting an eternal debate between researchers and clinicians to reach a consensus in defining this phenomenon in a comprehensive way. The latest edition of the DSM-V diagnostic manual has opted for a somewhat broad definition of psychosis, using the term to encompass all severe mental disorders where the individual “loses touch with reality”. Today, it is universally accepted that psychosis can occur in many clinical contexts, from schizophrenia and affective disorders to neurological, metabolic or substance abuse disorders. However, since psychosis has long been conceptually associated with schizophrenia, the two terms are often used interchangeably in both clinical and academic contexts.

The association between psychosis and the dream state can be observed in literature since the time of the great thinkers and psychopathologists of the world. Kant associates the psychotic individual with an awake dreamer, while Schopenhauer considers the dream as a short madness, and the madness as a long dream. Minkowski encompasses them in the term *alienation*, Schneider as *passivity*, and Jaspers associates them with the loss of critical abilities and judgment of one’s own experience. Freud considered psychosis as an intrusion of the dream activity into the waking state (Limosani et al., 2011).

Psychosis and the dream state

Any form of conscious experience recounted by an individual after waking, that can be assumed to have occurred during sleep, can be defined as a dream. REM sleep is most consistently associated with the most vivid and intense dreams, although convincing data has shown that some type of mental activity is possible during other stages of sleep. These perceptions and emotions generated internally display numerous cognitive peculiarities, such as a bizarre course, a key feature of the dream mentation, delusional thoughts and ideas, as well as a total lack of awareness or insight into one’s real mental state. With this in mind, the dream state can be considered similar to a psychotic episode present in mental disorders such as schizophrenia, characterized by hallucinations, loosening of associations, incongruity of personal experience, loss of self-reflective capacity and often accompanied by a strong emotional component. Both the psychotic patient and the dreaming individual cannot discern between external and self-generated per-

ceptions, accepting bizarre experiences as being synonymous with reality (Dresler et al., 2014).

One of the most important elements that creates an association between psychosis and the dream state is the insight, or rather, the lack of it. This metacognitive deficit is the main criterion and also the most fascinating feature of the dream state, being considered an almost universal element of the dream process. At the same time, in psychotic patients, especially in patients diagnosed with schizophrenia, studies say that the lack of insight is present in 50 to 80% of subjects. By having decreased self-reflective capacity, the patient has a low compliance to treatment, which leads to multiple decompensations and hospitalizations, affecting the long-term prognosis and overall quality of life. Thus, the concept of insight has become of major importance in recent years in research on schizophrenia (Dresler et al., 2014; Eiser, 2005).

Lucid dreaming represents the state of conscious awareness of a dream while the individual is sleeping. Lucid dreams are generally thought to arise from non-lucid dreams in REM sleep. The major difficulty in conducting lucid dream research is that it is very uncommon to have spontaneous dream lucidity. Subjects may, however, be conditioned through pre-sleep autosuggestion. Lucid dreamers often acquire lucidity when they train themselves to take bizarre dream occurrences as signs indicating the dreaming state. In an experimental setting, lucid dreamers can indicate to observers that they have become lucid by executing a preestablished set of eye movements. These voluntary eye movements can be used as a behavioral indicator of lucidity in the dreaming subject, as shown by EEG and EMG tracings of sleep, in conjunction with retrospective reports confirming that lucidity was achieved and that the eye movement signals were performed (Baird et al., 2019; Limosani et al., 2011).

Consciousness in dreaming and psychosis

Dream consciousness arises during REM sleep, in the context of a diminished sensitive and motor connection to the external environment. Freud has described consciousness as a primary process, a type of cognition characterized by an rudimentary, animalistic thinking process. Primary consciousness is a lower level of consciousness, based on the experience of *here and now*. It is meant to describe everything present in the perceptual space of the subject (Neculau, 2020), from one moment to the next, in a unitary block, with an absence of future-oriented planning or reflection on the past. In contrast, secondary consciousness is described as an awareness of consciousness, a higher order consciousness. In addition to the primary consciousness, it includes metacognitive processes such as the individual's ca-

capacity for reflection, judgment, deduction or inference. It is considered that during dream states, consciousness is mainly primary, so dreaming individuals do not have the ability to control or influence the experience happening during the dream. Primary consciousness is also dominant in the psychotic patient, when he has an altered capacity for self-reflection and autonomy (Voss et al., 2018, Voss et al., 2009).

Unlike ordinary dreams, the presence of insight is the defining criterion of lucid dreams. Within a lucid dream, the self-reflective capacity of the individual is present, as he is perfectly conscious of his dreaming state. He has the capacity to perceive reality as it is, so he recognizes hallucinations as being hallucinations, and he has various degrees of control of the narrative within the dream, with the possibility of initiating voluntary actions. Thus, within a lucid dream, both the primary consciousness and the secondary consciousness are present. Lucid dreams are rarely seen in normal subjects, but have the potential to be acquired through training. This concept has particular relevance in the research for ways to help patients gain insight in their psychotic states (Voss et al., 2018; Mota et al., 2016).

Lucid dreaming and dissociative mental states

Lucidity or insight refers to the individual's mental capacity to be conscious of his dreaming state. The ability to reflect on the present dream state requires the individual's approach from an "outside" perspective, a dissociation. The dreamer lives the dream experience as if it were playing on a screen, similar to the derealization from the waking state, or observing himself "from outside", similar to depersonalization. Dissociative elements are often accentuated in lucid dreams compared to the REM stage of ordinary dreams (Voss et al., 2018).

Dissociative thinking is normally brief in awake subjects and may occur as an isolated experience or in the course of several psychiatric disorders (Vlad, 2019). In healthy subjects, dissociative thinking is seen especially in daydreaming. It has been correlated with inclinations to fantasize during the day. Dissociative cognition is a common symptom closely associated with anxiety in psychotic awake patients, losing the sense of reality, thereby impairing orientation in the present moment (Eiser, 2005; Voss et al., 2018).

During psychosis, dissociative phenomena appear most frequently along with positive symptoms, thus being considered undesirable. However, recent studies suggest that dissociative thinking is transient in the early stages of the disease, and can subsequently lead to loss of self-identity or depersonalization. Thus, the dissociative phenomena in lucid dreams are similar to those in the early psychotic stages (Chirita et al., 2012). The increased fre-

quency of dissociations in lucid dreaming, compared to the normal REM stage, might lead to a decrease in quasi-psychotic dream phenomena, thus being considered desirable in the dream context. Dissociative thinking during the dream state can be a way to leave the quasi-psychotic state of dreaming, while dissociation in patients at risk can be a trigger for a full-blown psychotic episode. Also, it was observed that dissociative thoughts are correlated with a decrease in negative emotions, bringing forward the potential to study dissociation in lucid dreaming as a therapeutic intervention to reduce psychotic symptoms in the wake patients (Vallat & Ruby, 2019).

Beyond the phenomenological aspect, we can talk about numerous electrophysiological and imaging correlations. Dissociative phenomena are electrophysiologically correlated with selective increases in gamma band activity in the fronto-temporal areas, while the occipito-parietal regions maintain the typical profile for REM sleep. Also, there is alpha band suppression and defective communication between the frontal and temporal areas. In psychodynamic terms, these elements are conceptualized as symptoms of neurotic, borderline or immature type defense mechanisms, meant to avoid the suppressed desires of the awake individual (Macêdo et al., 2019; Voss et al., 2018).

Neural correlations

At the neuronal level, multiple correlations have been found between waking psychosis and dream states. During normal dreams occurring in REM sleep, the motor and visual areas show increased metabolic activity, which is suggestive for the hallucinations present in the dream state. The same phenomenon is observed in the amygdala, medial prefrontal cortex and anterior cingulate gyrus, areas involved in emotion processing. In contrast, the dorsolateral prefrontal cortex, supramarginal cortex, and precuneus, associated with the use of critical thinking and volitional processes, have decreased activity (Baird et al., 2019; Dresler et al., 2014).

Insight in lucid dreams has been associated with the activation of neocortical regions such as the dorsolateral and frontopolar prefrontal cortex, as well as the precuneus, supramarginal gyrus in the parietal cortex, and occipito-temporal regions. The prefrontal and parietal areas are involved in higher cognitive processes such as intelligence and memory. The dorsolateral prefrontal cortex is involved in exerting metacognitive functions and the precuneus is involved in the processing of self-referential thoughts. The activation pattern observed in these regions during REM sleep suggests the reinstatement of reflective capacities characteristic of the insight present in lucid dreams (Dresler et al., 2014; Mota-Rolim & Araujo, 2013).

Multiple neurophysiological studies in patients with schizophrenia have shown a close relationship between the absence of insight and decreased cognitive performance, mediated by the prefrontal cortex, aspect that is confirmed by neuroimaging studies. The latter also support the involvement of the parietal regions. Studies using functional MRI in patients with schizophrenia who were asked to perform tasks that test their ability of self-reflection suggested neural activation patterns in the regions of the upper left frontal gyrus, right medial frontal gyrus, bilateral precuneus, left inferior parietal lobe, and left angular gyrus (Mota-Rolim & Araujo, 2013).

The literature mentions a multitude of brain regions linked to the presence of insight in psychosis, the most important discoveries being related to the prefrontal, cingulate and medial parietal cortex, regions that show an overlap with areas of increased activity during dreams with insight. Because insight is associated with better treatment adherence in patients with schizophrenia, interventions that promote it are considered crucial for therapeutic success. These include antipsychotics, psychoeducation, cognitive-behavioral therapy, video self-observation and metacognitive training. The latter has been shown to stimulate the activity of the prefrontal cortex. This approach is often used for the induction of lucid dreams, by stimulating the capacities of self-suggestion and self-reflection. It has many applications in clinical practice, especially in nightmare therapy and is therefore suitable for research in order to use it widely to stimulate the induction of insight in patients with schizophrenia (Dresler et al., 2014).

Conclusion

Recent EEG and neuroimaging research shows that regions that are connected to insight deficits in psychosis are strongly activated in lucid compared to non-lucid dreaming. This correlation empirically supports the analogy between the metacognitive dysfunction in psychosis and non-lucid dreaming. Lucid dreams show a remarkable similarity at the neuronal level with insight psychosis. Research on lucid dreams, although limited to date, may be a starting point for the development of new strategies and techniques for inducing insight in patients with psychosis, thus contributing to a better long-term prognosis, treatment compliance and a better quality of life in these patients.

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