

**„The relationship between lucid dreaming and psychopathology. A systematic review “**

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**S1687719**

**Academic year 22/23**

## **Abstract**

Lucid dreaming (LD) is defined as one being aware of his/her state of dreaming. There are instances of lucid dreaming, where the individual can deliberately alter the reality of his/her dream (Tart, 1988). LD characteristics on one hand share similarities with symptoms of psychopathology such as dissociation and/or psychosis, which could enforce already exhibited symptoms, while on the other hand specific LD characteristics could provide useful insights and experiences that might be beneficial for psychotherapy outcomes such as symptom relief (Hobson and Voss, 2010). Yet currently little is known about which specific LD characteristics can be helpful for the treatment of mental illness, without risking worsening the mental health of a potential client. In this thesis, studies are described about how LD characteristics and psychopathology symptoms relate to each other through a systematic review of literature. After searching PubMed and PsycINFO electronic databases, seven articles published between January 1, 2013, and June 15, 2023, were identified. Although heterogenous in assessment and psychopathology symptom domain, the overall results were that LD frequency and intensity were positively correlated with symptom severity, but that degree in content control during LD appears to define whether the LD experience has alleviating or worsening effects on symptom severity. High intensity LD coupled with low control in content resulted in increases in psychopathology symptoms, while high intensity LD coupled with high content control led to a decrease. Limitations of literature and future directions, regarding the implementation of LD induction the goal of achieving content control are discussed.

**Key words:** lucid dreaming, psychopathology, symptoms, nightmares

## Introduction

Anomalous experiences such as lucid dreaming (LD), differ from ordinary dreaming in that the dreamer's self-reflective awareness is activated within the apparently unconscious dream state (LaBerge, 1985). Sometimes they offer an alternative perspective to the nature of self and reality (Cardeña, Lynn and Krippner 2017).

Lucid dreams are defined as one being aware of his/her state of dreaming. There are also instances of lucid dreams, where the individual can deliberately alter the reality of his/her dream, but that is not a necessity (Tart, 1988). Merely being aware of the dream state is already considered a lucid dream experience. Voss et al. (2012) found, that approximately 37% of adolescents and children were able to act out a sense of control during their lucid dreams. „Insight, control, and dissociation represent the defining criteria of lucid dreams“ (Van Eeden, 1913; Voss et al., 2009; Voss and Hobson, 2014). This ability declines with age, but overall, about 50% of the population has experienced one lucid dream during one's lifetime (Saunders et al., 2016; Schredl & Erlacher, 2011).

Research has shown that on one hand, there are similarities between lucid dreaming and some symptoms of psychopathology, and on the other hand, specific dream- and sleep occurrences are considered symptoms of psychopathology themselves (Hobson and Voss, 2010). Lucid dreams and psychosis for instance, share several features such as feeling disconnected from oneself or the inability to distinguish fantasy from reality. Individuals already experiencing psychotic episodes could risk additional severity of those symptoms that may impair their mental health further. Both experiences are immersive and happen in the here and now, as they disconnect the individual's consciousness from its environment. Lucid dreams, as well as psychosis appear to function under a similar level of consciousness (Hobson and Voss, 2010; Joli, 2011).

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Concerning the influence of such states on sleep, several correlations between nightmares, recurring dreams, and hypnagogic hallucinations were found. Hypnagogic hallucinations are hallucinations that occur as someone falls asleep. Those nightmares and/or hallucinations have been positively associated with psychopathological symptoms such as depression, anxiety, stress, and negative affect. They can be experienced as intrusions of the sleeping consciousness, the latter one entails the ability to be aware of the self, but not of one's body and/or surroundings, during different stages of sleep (Soffer-Dudek and Shahar, 2011; Soffer-Dudek, 2017a).

These intrusions can be considered as sleep disturbances (Tubbs, 2018). Sleep disturbances are diagnostic criteria to identify disorders such as depression and anxiety (APA, 2013). Sleep problems can lead to a heightened risk of developing a mood disorder *which could also be related to LD induced disruptions*. but mood disorder can also precede and/or cause sleep problems (Okun et al., 2018). Sleep disturbances are found in around 90% of clients diagnosed with depression (Tsuno et al., 2005) and up to 70% in anxiety cases respectively (Alvaro et al., 2013). This would lead to the question whether lucid dreams could potentially have detrimental effects on mental health, especially to individuals who already suffer from a mental condition, or whether those phenomena simply co-occur.

However, in stark contrast, other researchers claim that LD is associated with improved mental health and wellbeing as it can bring clarity and insight (e.g., Snyder and Gackenbach, 1988; LaBerge, 2014). Still, others claim that the induction of LD is associated with long-term increases in psychopathology symptoms (Aviram & Soffer-Dudek, 2018). Meaning that over a longer period, symptoms of psychopathology increased rather than decreased after frequent, deliberate LD induction. As La Berge (2014) mentioned in his book on LD awareness and control, that there are different degrees of lucidity. The mere existence of different degrees of sleep disturbances has led to the question of what constitutes the

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relation between the positive versus negative effect of LD, as well as the importance of the degree of lucidity.

Findings suggest that there are different levels of lucidity and different levels of sleep disturbances that go along with LD intensity as well as specific LD characteristics such as content control or confidence during LD episodes. The either beneficial or detrimental effect of a lucid dream episode on mental health, appear to depend on the nature of the arousal during sleep. When it is experienced as an intrusion per se it can result in heightened distress or other negative symptoms. For instance, in a sample with PTSD patients who already suffer from recurring nightmares, a deliberate LD induction without the necessary mental equipment would lead to more vivid nightmares. How equipped an individual is for such experiences, depends on the degree of control and confidence within the situation. A specific LD scenario that is experienced as uncontrollable could lead to increased stress and anxiety symptoms (Harb et al., 2016; Holzinger et al., 2020). When it is experienced under control and volition individuals are more likely to experience positive emotions during the lucid state, as they are in control of the situation. This degree in content control during dreaming might explain LDs inconsistent relation with psychopathology (Soffer-Dudek, 2017a).

In clinical practice of psychotherapy there have been attempts to include and use lucid dreaming for treatment. In an experimental study by Holzinger et al. (2020), it was observed that Lucid Dreaming Therapy (LDT) for posttraumatic stress disorder led to decreased anxiety and depression symptoms in the LDT group, although the treatment resulted in no significant changes in sleep variables. Nonetheless, the implementation of LDT was described as a useful tool to combat nightmares, especially in patients with psychological disorders (Holzinger et al., 2020). In another study by Aviram and Soffer-Dudek (2018), it was shown that deliberate LD induction led to long-term increases in dissociative symptoms and schizotypal experiences in undergraduate psychology students who participated in exchange for course credits. These

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conflicting results lead to the question if and how LD could be incorporated in psychotherapy. Therefore, it is important to weigh out the possible benefits and burdens before incorporating LD in a clinical setting, and to identify the characteristics of lucid dreams that dictate whether a particular LD experience has positive or negative effects on the mental health of its dreamer.

Summarizing the above, lucid dreaming has been shown to have contradicting relations with symptoms of psychopathology. Before deciding whether LD induction could be included in psychotherapy or rather should be left out for the client's safety, these relations must be investigated more thoroughly. In addition to specific LD characteristics (e.g., content control) it also needs to be researched what individual characteristics and/or diagnosis define LD's (in)effectiveness in a therapy setting. This paper focuses on the qualities and characteristics of LD. Some connections to specific psychopathology diagnoses are made such as narcolepsy and depression to name a few, but the focus remains on LD itself.

Therefore, the aim of this study is to review and synthesize research into the relation between lucid dreaming and symptoms of psychology from the last ten years, and to identify current research gaps in this area. Concluding on the current state of research, it will be discussed which LD characteristics are to be considered beneficial for psychotherapy and which characteristics might act as a burden to mental health outcomes.

## Method

### 2.1 Search Strategy and Identification

A comprehensive literature search was carried out to identify relevant studies including electronic bibliographic databases. The following electronic databases were searched: PubMed and PsycINFO.

The search string for PubMed was as follows:

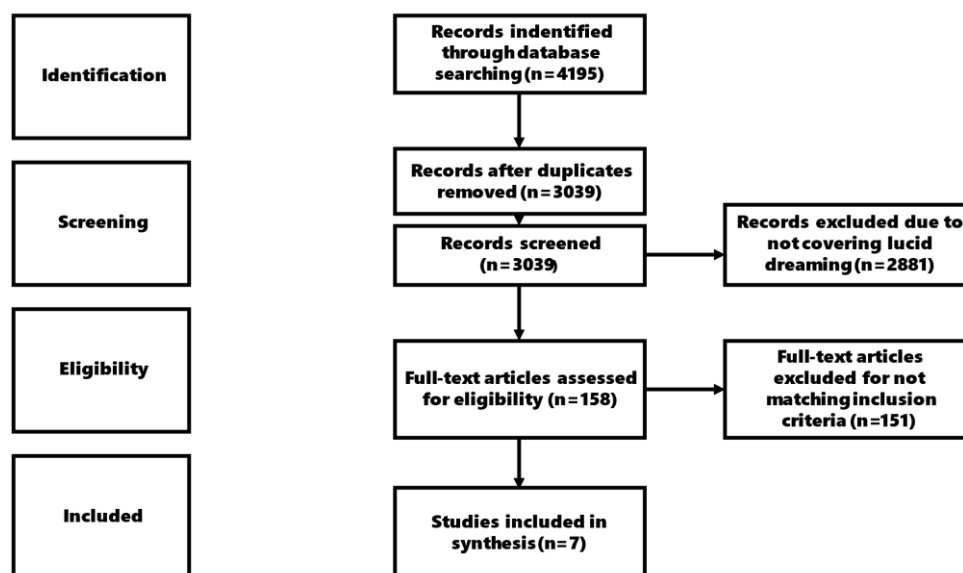
```
("lucid dreaming[All Fields]" OR "dream control[All Fields]" OR "conscious dreaming[All Fields]" OR "lucid"[All Fields] OR "lucidity"[All Fields] OR "dreamed"[All Fields] OR "dreams"[MeSH Terms] OR "dreams"[All Fields] OR "dream"[All Fields] OR "dreaming"[All Fields] OR "nightmare"[All Fields] OR "nightmares"[All Fields]) AND ("psychopathologies"[All Fields] OR "psychopathology"[MeSH Terms] OR "psychopathology"[All Fields] OR "psychiatric disorders[All Fields]" OR "mental disorders"[MeSH Terms] OR "mental"[All Fields])
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The search string for PsycINFO was as follows:

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((„lucid dream*“ OR „dream control“ OR „conscious dreaming“ OR lucid OR lucidity OR dreamed OR dreams OR dream OR dreaming OR nightmare*)) AND ((psychopatholog* OR „psychiatric disorder“ OR „mental disorder“ OR mental))
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After removing articles published before 2013, the searches yielded 2076 and 2119 results, respectively. Both searches were conducted on the 15th of June 2023.

Studies that met inclusion criteria (see below) were systematically reviewed using the PRISMA (Preferred Items for Systematic Reviews and Meta-Analysis) guidelines (Moher et al. 2009) (see Figure 1).



**Figure 1.** PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) search and selection diagram (Moher et al. 2009).

## 2.2 Inclusion and Exclusion Criteria

Studies were included when they assessed 1) an objective and/or subjective assessment or measurement of lucid dreaming (see Figure 2 for operational definitions) and 2) its relationship to a) a mental health diagnosis, as defined by DSM-5 criteria (APA, 2013), or b) psychopathology symptoms, defined as those strongly associated with or required for a formal diagnosis of a psychological disorder (e.g. psychosis, depression), as assessed by a validated measure of such symptoms (e.g. Beck Depression Inventory), or a LD related therapy regimen applied during the respective study. This included studies that implemented some variation of LD induction into a therapy approach leading to changes in mental health



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variables due to LD induction. Studies were excluded from the screening process when 1) they were older than ten years, as it was assumed that concurrent research would be referring to the most relevant findings of the past, 2) written in a different language than English or German, or 3) when the relationship between LD and medical conditions (e.g., physical pain) was investigated without the connection to mental health variables. Studies were not excluded when the LD state was drug or medication induced.

### **Results**

#### **Study Selection**

See Figure 1 for PRISMA diagram of study search and selection process for an overview of the study selection process. After removing duplicates from the 4195 found, 3030 articles' titles and abstracts were screened for eligibility. From these 3039 articles screened, 2881 did not mention the concept of LD, leaving 158 full-text articles for the assessment of eligibility for the synthesis. Of those 158 articles, 151 were considered ineligible, due to 8 of those being reviews, while the rest did not research LD and its connection to psychopathology symptoms. In total, 7 studies met the inclusion criteria and were included in this review. Concerning the improvement of the search string, it can be stated, that there were a lot of false positives found, yet the string was revised and improved iteratively. In order, to avoid false negatives, the authors refrained from making it any more specific.

#### **Study Characteristics**

See Table 1 for a summary of all included studies. The selected studies took place in Europe (n = 3), South America (n = 1), North America (n=2), and Israel (n=1). Overall, all seven studies assessed lucid dreaming characteristics, as well as symptoms of psychopathology. They are summarized shortly below.

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Aviram and Soffer-Dudek (2018), developed an expansive measure of LD characteristics called the Frequency and Intensity Lucid Dream Questionnaire (FILD). In their 2018 study they aimed to explore the relationship between LD characteristics and psychopathological symptomatology such as depression, dissociation and schizotypy in 187 undergraduate students by assessing psychopathology symptoms, as well as sleep variables (e.g., Iowa Sleep Experience Scale (ISES)). Two months later, they measured psychopathology again, with a subsample (n = 78) and had them complete a dream diary each morning for fourteen days. Their findings provide preliminary evidence that suggests that the FILD questionnaire demonstrated adequate reliability and validity. Concerning the relation between LD and psychopathology symptoms, the authors concluded, that lucidity characterized by high intensity and positive affect will lead to fewer psychopathological tendencies, as the higher positive emotional valence coupled with high intensity LD was inversely related to distress variables. Intensity, not frequency of LD was inversely related to psychopathology symptoms, yet this undermines the importance to assess LD as a complex phenomenon, instead of focusing on single LD characteristics as was done in earlier research.

This study was one of the first to assess longitudinal consequences of LD experiences. It is limited by its measures relying solely on self-reports rather than objective assessments, which may have inflated the associations between the studied concepts. Furthermore, the sample consisted of nonclinical, mostly female, undergraduate students which may undermine the generalizability of the findings further. As several of the effects found were quite small, replication of such findings in future studies is needed, to gain more confidence in drawing conclusions about causality (Aviram & Soffer-Dudek, 2018).

Harb et al., (2016) investigated the effect of adding Image Rehearsal (IR) to a Components of Cognitive-Behavioral Therapy for Insomnia (cCBT-I) approach for veterans suffering from PTSD. They assessed LD characteristics such as dream awareness and content

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control and how these changed after the therapy. They found that the sample had a relatively high degree of dream awareness, but a low degree of content control during their lucid dreams, leading to the suggestion that the degree of control dictates whether the lucid dream is experienced as distressing or helpful. The combination of high intensity and low control may further contribute to the distressing nature of posttraumatic nightmares, which often replicate traumatic events. Limitations regarding the study are, that the sample was limited to only treatment-seeking military veterans with PTSD who identified recurrent nightmares as a significant problem. Their LD profiles may differ from other populations suffering from different kinds of traumata and nightmare disturbances (Harb et al., 2016).

Holzinger et al., (2020) tested the effectiveness of Lucid Dreaming Therapy (LDT) for PTSD patients suffering from nightmares. The sample consisted of 31 participants, who were randomly assigned to LDT (n=20) or a credible comparison condition which did not receive any treatment during the six weeks. All the subjects kept a sleep diary for the next six weeks. The LDT condition entailed a 60 min session every week for the duration of the six-week study. They assessed psychopathology symptoms, such as anxiety and stress measures, as well as sleep quality and nightmare severity. LDT appeared to have no effect on the investigated sleep variables and there was also no correlation between nightmare severity reduction and changes in PTSD profiles. Nevertheless, depression and anxiety levels of participants decreased significantly over the course of therapy. Limitations of the study were the limited sample size, as highly medicated participants had an especially hard time to stay motivated during therapy. The duration of the therapy was also quite short. The sample was heterogenous and unrepresentative for general conclusions, in that the majority of patients had a comorbid substance use disorder. As the sample was highly inhomogeneous and prone to early dropouts and incomplete questionnaires, the authors concluded that qualitative single case studies are needed to gain confidence in the current findings (Holzinger, 2020).

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Mota et al., (2016) investigated lucid dreaming in 73 patients with psychotic symptoms. Participants were either assigned to schizophrenia-treatment (25), bipolar disorder treatment (20), or a non-psychotic control condition (28). Out of the 73 participants, 45 were under medication. They wanted to test out whether 1) psychotic patients experience LD less frequently than non-psychotic individuals, whether 2) psychotic patients report LD control less frequently than non-psychotic individuals and whether 3) psychotic patients who experienced LD present attenuated psychiatric symptoms and less thought disorder. All three hypothesis were falsified in that, psychotic patients were not less likely to experience LD or LD control. Also, schizophrenia patients who reported LD instances were more symptomatic, not less, than non-lucid dreamers within the same condition. No clinical advantage for LD induction in psychotic patients could be found. The authors concluded that training dream lucidity is likely to produce psychological strengthening for non-psychotic populations but may further enable symptoms such as deliria and/or hallucinations in psychotic populations. Limitations of the study were that LD lifetime prevalence was assessed but not whether the participants experienced LD during the research. Also, it was not assessed whether psychotic patients would experience LD specifically during the psychotic episodes.

Rak et al., (2015) explored whether LD provides relief during nightmares in 83 diagnosed narcolepsy patients. They measured the frequency of recalled dreams (DF), nightmares (NF), and lucid dreams (LDF), and compared them to healthy controls. They found that narcolepsy patients were experiencing a markedly higher lucid dreaming dream recall, and nightmare frequency than controls. The differences in DF, NF and LDF between narcoleptic and controls were all significant. 70% of narcoleptic patients also reported that dream lucidity provided relief during nightmares. Thus, indicating that LD could be useful for combatting nightmare disorders in these patients. Limitations of the study were that medication used by participants could have contributed to the results, yet dosages or times

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could not be obtained by the researchers of the study. Also, the participants were only interviewed once, and data was highly subjective by depending on individual memory. It needs to be investigated whether the findings could be replicated with subjects with different sleep disorders, to test whether they are exclusive to a specific diagnosis like in this case narcolepsy or whether the knowledge could be applied to the general population (Rak et al., 2015).

Sackwild et al., (2021) investigated the relationship between lucid dreaming and depression. 163 participants filled out questionnaires on LD characteristics such as frequency and depression? The sample consisted of mostly lucid dreamers. LDs occurred predominantly spontaneous, as they did not proactively attempt to induce the LD state. Six of the survey participants (lucid dreamers that have been diagnosed with depression) were interviewed about how they utilized their lucid dreams to alleviate their depression symptoms in the past. Mentioned ways of interviewees how lucid dreaming helped them alleviate depression symptoms were the facilitation of self-exploration and insight into the conscious and subconscious inner-self, enabling understanding and adaption to their situation. The authors concluded that both quantitative as well as qualitative results suggest that LD can be an effective tool for treating mental health issues, specifically depression. Limitations of the study were, that the qualitative sample was unrepresentative in a way that they were no longer using medication and exhibited mild symptoms of depression, as individuals with high scores on depression scales were excluded from the interviews, as interviewing them could trigger unsettling emotions and thoughts. This small sample makes it hard, to account for potential confounding factors. Five out of the six interview participants were experiencing lucid dreams spontaneously rather than by trying to deliberately induce the LD state, so it must be further tested whether the findings could be replicated with depressed individuals who are not natural born lucid dreamers (Sackwild, 2021).

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Yount et al., (2023) developed an online lucid dream healing workshop for reducing self-reported PTSD symptom severity. Secondary outcome measures included nightmare frequency, well-being, and positive and negative affect. Out of the initial 144 respondents, 49 met inclusion criteria and participated in the 6-day workshop that was administered through Zoom. The inclusion criteria were being at least 18 years old and experiencing PTSD symptoms as determined through self-reports on the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-5<sup>th</sup> ed (DSM-V), but not necessarily having an official PTSD diagnosis by a clinician. Six out of the 49 eligible participants also consented to saliva probes that would be used for researching psychophysiological correlations between the studied concepts. The key findings were a lessening of self-reported PTSD symptom severity, nightmare distress, and negative emotion, as well as increased overall well-being. Overall, the rate for achieving lucid dreams by participants was high, indicating the effectiveness of the workshop in inducing LD. Limitations of the study were the reliance of self-reported data in terms of when a lucid dream happened as objective verification through using sleep recording technology during REM was not possible. Also, participants were free to choose the induction method, so a certain heterogeneity is given which makes it hard to generalize findings and needs further research (Yount et al., 2023) The induction methods techniques taught during the workshop included: attention to dream signs, reality checks, wake-up-back-to-bed sleep protocol, mnemonic technique, and falling sleep consciously (Stumbrys et al. 2012). Medication involved could also act as a confounding variable and should as well be considered when researching the topic further.

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**Table 1.**

**Description of Studies Selected for Formal Review**

Study	Location	Psychopathology Symptoms or Diagnosis	Aim of study	N	Age (Y), Mean, Range	% male	Psychopathology measures	Main findings
Aviram & Soffer-Dudek, 2018	Israel	Sleep problems, depression, anxiety, stress, dissociative experiences, and psychotic tendencies.	Develop FILD; investigate associations of LD characteristics and psychological distress; Explore whether deliberate LD induction predicts change in psychopathological symptoms.	187	23.39, 18-28	29.0	FILD, ISES, GSAQ, BDI, MOCI, PSS, DES-II and MIS	LD frequency positively predicted longitudinal increase in dissociation and schizotypy symptoms. High intensity lucid dreamers not more resilient than non-lucid dreamers.
Harb et al., 2016	United States	Chronic nightmares, PTSD, disturbed sleep.	Examined the relationship between LD and disturbed sleep and other PTSD symptoms. Testing effect of LD on Components of Cognitive-Behavioral Therapy for Insomnia.	33	37.91, N/A	78.8	ISES, NFQ, NDQ, PSQI, PCL-M,	Significantly greater change in content control for participants in the Image Rehearsal + Components of Cognitive-Behavioral Therapy for Insomnia group. Decreased nightmare distress through content control.
Holzinger et al. 2020	Austria	PTSD, nightmares, dysphoric dreams, anxiety, depression.	Evaluate Lucid Dream Therapy in patients with PTSD with nightmares and whether LDT leads to nightmare reduction.	31	41.58, 27-59	41.9	SCL-90-R, IES-R, PSQI, ESS, MQLI, SAS, SDS, PSS, Sleep/Dream Checklist	significant nightmare reduction, effectiveness of Lucid Dream Therapy could not be found; No changes in PTSD profile.
Mota et al. 2016	Brazil	Psychosis, schizophrenia, bipolar disorder.	Quantitatively characterize lucid dreaming in psychotic patients	73	35.59, N/A	70.0	PANSS, BPRS, dream report	Psychotic lucid dreamers reported control of their dreams more frequently than non-psychotic lucid dreamers.

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Rak et al. 2015	Germany	Narcolepsy	Investigate lucid dreaming in patients with narcolepsy	83	53.80, 23-82	58.8	DF, NF/LDF	Lucid dreaming frequency higher in narcoleptic patients; DF, NF and LDF higher.
Sackwild et al. 2021	Germany	Depression	Investigate link between lucid dreaming and depression and identify mechanisms of lucid dream therapy for depression.	163	37.8, 18-78	40.5	Questions about lucid dream characteristics and symptom relief, PHQ-8	Lucid dreaming can alleviate depressive symptoms; No relationship between Lucid dream frequency and depression found.
Yount et al. 2023	United States	PTSD	Measure effect of a Lucid Dream Healing Workshop for individuals with PTSD symptoms.	49	47.8, N/A	31.0	LEC, PCL-5, LDF, DLQ, NExS, AIOS, PANAS	Significant improvements in self-reported PTSD symptom scores, nightmare distress, and well-being.

FILD, Frequency and Intensity Lucid Dream questionnaire; ISES, Iowa Sleep Experience Survey; GSAQ, Global Sleep Assessment Questionnaire; BDI, Beck Depression Inventory; MOCI, Maudsley Obsessive Compulsive Inventory; PSS, Perceived Stress Scale; DES-II, Dissociative Experience Scale; MIS, Magical Ideation Scale; PTSD, Posttraumatic Stress Disorder; NFQ, Nightmare Frequency Questionnaire; NDQ, Nightmare Distress Questionnaire; PSQI, Pittsburgh Sleep Quality Index; PCL-M, PTSD Checklist-Military; SCL-90-R, Symptom Checklist 90-Revised; IES, Impact of Events Scale; ESS, Epworth Sleepiness Scale; MQLI, Multicultural Quality of Life Index; SAS, Self-Rating Anxiety Scale; SDS, Self-Rating Depression Scale; MADRE, Mannheim Dream Questionnaire; GAD-7, Generalized Anxiety Disorder 7-Item Scale; ASPP, Affective and Sensory Psychotherapy; GAD, Generalized Anxiety Disorder; PANSS, Positive and Negative Syndrome Scale; BPRS, Brief Psychiatric Rating Scale; DF, Dream Recall Frequency; NF, Nightmare Frequency; LDF, Lucid Dream Frequency; PHQ-8, Patient Health Questionnaire; LEC, Live Events Checklist for DSM-5; PCL-5, PTSD Checklist for DSM-5; DLQ, Dream Lucidity Questionnaire; NExS, Nightmare Experience Scale; AIOS, Arizona Integrative Outcome Scale; PANAS, Positive and Negative Affect Schedule;



### **Lucid dream characteristics and symptoms of psychopathology**

In order, to review the findings of the seven studies synthesized in this paper, relevant concepts were separated into categories. The categories and the line of thinking behind their creation is explained in the following.

First, LD was divided into the two categories: frequency and intensity. Frequency describes the number of LDs an individual is experiencing in the measured time window, while intensity entails on one hand, the intensity or degree of awareness during the LD episode and on the other hand other factors such as the degree of control the dreamer has during LD. Differences between respondents with and without mental illnesses are discussed in their respective section.

Afterwards, relevant findings of the reviewed studies were grouped by diagnosis. For instance, studies who specifically recruited individuals suffering from for example PTSD were discussed together. Other included diagnoses were narcolepsy and depression. The concept of nightmares was also included as its own category since it is closely linked to sleeping in general and can also have an influence on mental health variables. As lucid nightmares could be especially influential experiences, the relationship between nightmares and lucidity was deemed to be important.

Finally, the last category concerning the implementation of LD (induction) techniques into psychotherapy, as well as the effect of spontaneous LD experiences on the process was created. As psychotherapy is an environment where symptoms are combatted and changed (either positively or negatively, seeing how LD characteristics seemed to alter the treatment was also an interesting question.

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### **Frequency**

Three studies measured the frequency of lucid dreams. The study from Aviram and Soffer-Dudek (2018) investigated the effect of frequency of lucid dreaming on psychopathology symptoms and did not find significant correlations between the lucidity frequency scale and psychopathology/stress measures. Yet, LD frequency positively predicted longitudinal increases in dissociation and psychotic symptoms such as hallucination and delusion (Aviram & Soffer-Dudek, 2018). Sackwild et al., (2021) found that 93.3% of their sample (n = 153) reported to have lucid dream experiences, yet they found no significant association between lucid dream frequency and depression score for the entire sample (Spearman's  $\rho = -0.2$ ,  $p = .834$ ). Yount et al., (2023), reported that 76% of participants (i.e., 37 out of 49) achieved at least one lucid dream during their workshop, yet they could not confirm that LD (frequency) per se was the reason for the improvement in well-being as the increase in well-being and positive mood after awakening could be attributed to other factors such as the group therapy itself, social support, and interpersonal learning to name a few (Yount et al., 2023). Concerning the conclusion about LD frequency and psychopathology symptoms, it can be stated, that the frequency by itself does not provide a promising foundation for improving mental health outcomes. Furthermore, the diagnosis and/or symptoms researched by the authors of the three articles are too heterogeneous in origin to be clustered together, hence they are investigated separately in following sections.

### **Intensity**

Four studies investigated the effects of degree of awareness or intensity on the healing properties of lucid dreams. Aviram and Soffer-Dudek (2018) assessed intensity of LD and found that their lucidity intensity scale was significantly inversely correlated with depression,

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anxiety, and stress symptoms, indicating that a higher intensity of LD experiences was related to a lower level of symptoms of depression, anxiety, or stress. Out of the intensity characteristics of LD, the degree of content control as well as the degree of confidence, and positive valence were associated with lower levels of symptoms. Furthermore, when comparing profiles of lucid and non-lucid dreamers, high-intensity lucid dreamers were not more resilient against depression and anxiety than non-lucid dreamers implying that the degree of control and confidence during lucidity dictate whether it is experienced as positive or distressing, not the the degree of awareness in lucidity itself. Yount et al., (2023) compared the levels of lucidity between healing and nonhealing lucid dreams and found that the average Dream Lucidity Questionnaire (DLQ) score was lower for nonhealing lucid dreams ( $M = 0.90$ ,  $SD = 0.91$ ) compared to healing lucid dreams ( $M = 1.52$ ,  $SD = 0.91$ ). Meaning that nonhealing lucid dreams were less intense than healing lucid dreams. The significance of this difference further strengthens the notion that intensity is related to decreased depression, anxiety, and stress symptoms. The authors concluded that the workshop was effective in alleviating symptoms of depression but could not attribute the effect to LD alone. Harb et al, (2016) found that only around nine percent of participants experiencing dream awareness frequently had a sense of frequent dream control, implying that achieving control is rare and potentially difficult. Mota et al., (2016) found that psychotic lucid dreamers reported dream control more frequently than non-psychotic lucid dreamers. The findings of the four studies that investigated LD intensity, reflect the notion that intensity is inversely related to symptoms of psychopathology. With content control being the the most relevant aspect of intensity/awareness, as it enables the dreamer to have a safe and positive experience as compared to a dream scenario that one is highly aware but has no or little control during that LD episode potentially eliciting negative emotions.

### **Lucid dreaming and narcolepsy**

Rak et al., (2015) found that narcolepsy patients had a significantly higher dream recall frequency, nightmare frequency, as well as lucid dream frequency when compared to controls. This implies that on one hand that individuals with diagnosed narcolepsy are more prone to experience LD when compared to healthy individuals, but on the other hand highlights their susceptibility for negative consequences of LD experiences.

### **Lucid dreaming and nightmares**

Four studies investigated whether LD can be a tool to provide nightmare relief. Rak et al., (2015) who investigated LD characteristics in narcoleptic patients found no significant difference in nightmare severity.

Harb et. al., (2016) found that the LD construct of content control demonstrated a significant relationship with nightmare distress. When they compared the Image Rehearsal and Cognitive-Behavioral Therapy for Insomnia (IR + cCBT) and the Cognitive-Behavioral Therapy (cCBT-I) only condition, they found that the increase in content control was strongly associated with decreased nightmare distress.

Holzinger et al., (2020) failed to achieve any significant effects on nightmare reduction with their therapy approach. Ratings of interference of nightmares on quality of life and daily functioning remained unchanged.

Yount et al., (2023) measured nightmare distress in their sample by administering the Nightmare Experience Scale (NexS). They found significant decreases in nightmare frequency and distress after the 6-day LD induction workshop, and those effects were retained at the 1-month follow-up. Yet, they could find no significant difference in NexS scores

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between participants who had a lucid dream versus those who did not. The workshops attenuated nightmare symptoms for lucid as well as non-lucid dreamers equally, leading to the conclusion that LD itself is not crucial in alleviating nightmare distress and frequency, but rather the degree of content control versus dream awareness as mentioned by Harb et al., (2016). In conclusion, it can be stated, that the experience of LD did not result in nightmare severity reduction. Although, individuals suffering from nightmares as well as mental disorders such as narcolepsy are more likely to enter the LD state, they were not more likely to overcome the nightmare experience through LD frequency alone. Again, the importance of content control was stressed.

### **Lucid dreaming and depression**

Sackwild et al., (2021) measured the well-being of their participants by administering the Patient Health Questionnaire (PHQ-8) and found that there was no significant difference in scores between those with LD experiences and those without. Most participants agreed or strongly agreed to the statements that lucid dreaming helped them when they were feeling depressed, that they have experienced some form of mental healing from lucid dreaming, and that they experienced a (positive) dramatic change in their life from lucid dreaming.

### **Lucid dreaming and posttraumatic stress**

Three studies researched the relationship between LD and posttraumatic stress disorder symptoms. As already mentioned, Harb et al., (2016) found no significant

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relationship between the LD constructs awareness, content control, and purposeful waking and PTSD severity. Holzinger et al., (2020) also found no changes in PTSD profiles of their participants. Only the study by Yount et al., (2023) found significant improvements in the PTSD symptoms, for all participants over the three time points (pre, post, follow-up) after an LD workshop/therapy. Yet, they failed to find significant differences in PCL-5 scores between participants who had a lucid dream versus those who did not, leading to the assumption that other factors of the treatment condition acted as confounding variables and that the effect cannot be attributed to LD specifically.

### **Lucid dreaming and psychotherapy**

Two of the seven studies synthesized in this paper, implemented lucid dream induction techniques into a clinical treatment regimen to assess its effect on the patient's symptoms and dream experience. Harb et al., (2016) found that their combination of Image Rehearsal and Cognitive-Behavioral Therapy for Insomnia (IR+ cCBT-I) demonstrated significantly greater changes in content control when compared to the cCBT-I condition. Furthermore, they found that for the total sample, the increase in content control in the treatment condition demonstrated medium to large correlations with decreases in nightmare frequency, nightmare distress and general sleep disturbances. Holzinger et al., (2020) investigated the effectiveness of Lucid Dreaming Therapy (LDT) for patients with posttraumatic symptoms, and found that in the LDT group, anxiety and depression levels decreased significantly as indicated by reduced scores on the Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) at the end of therapy, yet they could not find a clear relationship between the effects of the treatment and the frequency, as well as intensity of LD. Concerning the PTSD profiles of the participants, no changes were found. Sleep quality, daytime sleepiness and severity of

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symptoms did not improve significantly. They also found no significant differences regarding the parameters between groups. The overall conclusion regarding LD as part of a treatment plan in treating mental disorder is, that the implementation of LD resulted in an improvement of mental health symptoms such as stress, depression, and nightmare frequency, as well as severity. This was attributed, again, to the degree of content control acted out during LD episodes rather than frequency of LD.

### **Discussion**

This thesis aimed to review the efforts of the last decade of investigating the relationship between LD and psychopathology symptoms. The goal was to synthesize the knowledge on this topic, to draw new conclusions and suggest certain LD characteristics as the focus of future research. Earlier research has found a bidirectional relation between LD and psychopathology symptoms (e.g., Snyder and Gackenbach, 1988; LaBerge, 2014), meaning that LD appears to alleviate and worsen symptoms of psychopathology, leading to the need for further investigation about which LD characteristics specifically, are responsible for either outcome.

Overall, the implementation of LD induction into therapy approaches appeared to be beneficial for the mental health of clients suffering from disorders such as depression. Out of the seven articles reviewed, four studies found alleviating effects on psychopathology symptoms such as depression, anxiety, and stress (Harb et al., 2016; Holzinger et al., 2020; Sackwild et al., 2021; Yount et al., 2023, but they could not attribute the positive effects on mental health to LD in general. A high degree LD frequency by itself, did not appear to be a necessity for improving symptom severity. As Aviram & Soffer-Dudek (2018), as well as Harb et al., (2016) concluded, a specific LD characteristic, namely content control dictates

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whether the LD experience is beneficial for the mental health of the dreamer, frequency without a sufficient degree of content control could lead to a worsening of mental health outcomes.

Three studies found that a higher LD frequency was associated with increases in psychopathology symptoms such as dissociation and psychosis (Aviram & Soffer-Dudek, 2018; Mota et al., 2016; Rak et al., 2015). Furthermore, when comparing profiles of lucid and non-lucid dreamers, high-intensity lucid dreamers were not more resilient against depression and anxiety than non-lucid dreamers. This implies /could be explained by considering ... that LD induction without the proper preparation to achieve a sufficient degree of content control could have detrimental effects on clients who already suffer from a mental disorder such as PTSD, schizophrenia, or bipolar disorder, or individuals who are on their way to develop such a disorder (Mota et al., 2016; Rak et al., 2015).

The implications of the synthesized findings are twofold: On one hand content control turned out to be the defining factor in LD experiences and whether those elicit positive or negative symptoms. In contrast to frequency and intensity, without control over the situation, were deemed to be detrimental to mental health outcomes. Therefore, content control would be a promising tool to overcome symptoms of psychopathology. On the other hand, it was found that not only are individuals diagnosed with a mental disorder such as depression and PTSD more likely to experience a LD, but they are also more prone to experience an increased symptom severity due to LD when compared to healthy individuals. Shortcomings of the studies reviewed, are the heterogeneous samples that at this point lack validity. This could be changed by replicating earlier studies and including other mental disorders. Of course, the ethical applicability should be considered when vulnerable individuals might be



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exposed to potential harm, as the outcome cannot be enforced at the current stage of research. A question that remains unanswered is how the degree of control during LD can be manipulated. Since the higher the degree of content control, the better the mental health outcome, it could be speculated that a method that would enable clients to deliberately induce content control, would be an argument to justify the implementation of LD induction into the treatment regimen. Future research should explore the concept of control further, so possibilities to alter the degree of control can be discovered.

Given the findings discussed above, it can be concluded, that although individuals with mental disorders such as schizophrenia and narcolepsy are more capable of entering dream lucidity as they already experience symptoms that are similar to LD characteristics, they are not more resilient against the negative effects a bad LD could have on their mental health. It might be even more dangerous to expose untrained individuals to deliberately induced LD, knowing the potential consequences.

A strength of this review were the search strings and the screening process in general, as the string could be considered solid and replicable, although it could be useful to make it more specific to avoid false positives. Concerning the limitations of this paper, the possibility of having missed relevant literature cannot be ruled out completely, as it appears that there were likely articles missing in the two databases searched, that would be considered useful for this review, as papers were mentioned within the articles synthesized that covered relevant topics and were no older than 10 years. Also, by improving the search string, by widening the scope, said missing articles could have still been found by adjusting it. Another weak point is that the author of this paper did not distinguish between studies that induced LD deliberately and studies that observed results of spontaneous LD occurrences. By differentiating between those two circumstances, differences in LD characteristics between spontaneous and deliberate LD episodes could be unveiled, besides the main finding of the importance of

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content control during LD episodes. Nonetheless, the synthesis of articles reviewed managed to identify the LD characteristic of content control to be the most important factor in guaranteeing a positive mental health outcome. Therefore, the focus of further research should lie on developing tools or techniques that enable individuals to act out content control during episodes of LD.

Another aspect that is hindering the generalizability of concurrent findings is that confounding variables such as comorbid substance abuse disorders or the therapeutic alliance contributed to the results. This has led to significant improvements of psychopathology symptoms being attributed to the overall therapy condition instead of LD itself. Furthermore, as frequent LD onset and its deliberate induction are correlated with long-term increases in psychopathology symptoms such as dissociation and schizotypy (Aviram & Soffer-Dudek, 2018), future research should focus on the development of safe techniques that not only grant the individual an entry into the lucid state, but rather equip the individual with tools that secure content control and confidence during those state.

The main finding of the articles reviewed appears to be the role of content control in LD. According to Mota et al., (2016), frequent LD without a sufficient sense of control during these instances could worsen experienced stress and act as an additional burden to individuals already suffering from mental health issues. Therefore, potential implementation should be considered with the potential harm in mind. The degree of control during those LD episodes appears to dictate whether the LD is experienced as the insightful state which enables the mind to positively influence the dreamer's waking life by improving the management of mental impulses emotions, and conflicts (Gackenbach & LaBerge, 1988).. This proactive state, where one feels in control of the situation, regardless of how applicable the dream situation may be to reality, is what makes the lucid dream experience positive (Harb et al., 2016). In case the individual experiencing a LD has no sense of control and/or confidence in

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his/her ability to control the dream setting, coupled with a distressing nightmare, would lead to a significantly worse experience for the dreamer. Hence the need for research into specific LD characteristics such as content control rather than frequency and/or intensity. Finally, how one could induce control during LDs specifically, without triggering negative elements of the LD experience, might be the main goal as well as concern for the next decade. The development of an environment where individuals, especially those diagnosed with a psychopathological disorder, can learn to implement LD induction techniques without risking additional trauma or further increases in symptomatology is a complex, yet intriguing mission for LD and sleep experts.

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