

Lucid Dreaming Treatment for Nightmares: A Pilot Study

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Key Words

Nightmare treatment · Lucid dreaming therapy

Abstract

Background: The goal of this pilot study was to evaluate the effects of the cognitive-restructuring technique 'lucid dreaming treatment' (LDT) on chronic nightmares. Becoming lucid (realizing that one is dreaming) during a nightmare allows one to alter the nightmare storyline during the nightmare itself. **Methods:** After having filled out a sleep and a posttraumatic stress disorder questionnaire, 23 nightmare sufferers were randomly divided into 3 groups; 8 participants received one 2-hour individual LDT session, 8 participants received one 2-hour group LDT session, and 7 participants were placed on the waiting list. LDT consisted of exposure, mastery, and lucidity exercises. Participants filled out the same questionnaires 12 weeks after the intervention (follow-up). **Results:** At follow-up the nightmare frequency of both treatment groups had decreased. There were no significant changes in sleep quality and posttraumatic stress disorder symptom severity. Lucidity was not necessary for a reduction in nightmare frequency. **Conclusions:** LDT seems effective in reducing nightmare frequency, although the primary therapeutic component (i.e. exposure, mastery, or lucidity) remains unclear.

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Introduction

An estimated 3–8% of the adult population suffers from nightmares [1–4], albeit prevalence estimates vary with different thresholds for and definitions of nightmares. For example, the prevalence of *primary* sleep disorders, of which nightmares are a part, was less than 1% in a systematic study on the prevalence of mental disorders [5]. The need for prevalence studies on mental disorders [6] applies especially to nightmares.

Nightmares disturb sleep [7, 8], cause daytime distress [9, 10], induce physical complaints [11], and may elicit a 'fear of going to sleep' [12]. Chronic insomnia and sleep-disordered breathing (sleep apnea) are related to nightmares as well [2, 13]. Moreover, nightmares can occur as part of a posttraumatic stress disorder (PTSD) or a posttraumatic stress reaction (without complete PTSD) after experiencing a traumatic event [14]. Both posttraumatic [15] and non-posttraumatic (so-called idiopathic or chronic) nightmares [4, 7] seem to be very persistent if not treated properly.

Several cognitive-behavioral techniques are effective in reducing nightmare frequency. Monitoring nightmares [16], relaxation [17, 18], and exposure/systematic desensitization [18–20] all reduce nightmare frequency, although exposure has demonstrated the best outcomes [20]. In a study using self-help manuals, exposure reduced nightmare frequency significantly better than relaxation

alone (no reduction in the waiting list group). However, there were high numbers of dropouts (almost 60% in the self-exposure group and 40% in the relaxation group); nonetheless, exposure remained superior to relaxation in an intent-to-treat analysis.

Cognitive-restructuring techniques for nightmares also employ exposure but focus additionally on the alteration of the nightmare storyline (mastery). Imagery rehearsal treatment (IRT) [21], its mechanisms first described by Marks [22] in a case study, is a cognitive-restructuring technique in which participants are instructed to write down one specific nightmare and to change the nightmare any way they wish. The altered nightmare is written down during the treatment session and rehearsed mentally at home.

IRT has shown good results in randomized controlled trials, with effect sizes of over 1 for nightmare frequency reduction [21] and posttraumatic nightmare frequency reduction [23, 24]. In addition, IRT improves sleep quality and decreases PTSD symptoms. Although IRT is a highly promising technique, the cited IRT studies had a dropout rate of up to 40%.

A study of alternative cognitive-restructuring techniques such as lucid dreaming treatment (LDT) seems warranted. In a lucid dream, the person is aware that he or she is dreaming. Lucid dreaming has been verified by volitional eye movements in the sleep laboratory [25] and studies have shown that lucid dreaming is a cognitive skill that can be learned [26, 27]. Moreover, since several studies have found a positive relationship between spontaneous lucid dream frequency and nightmare frequency [3, 28], it seems plausible that nightmares trigger lucid dreaming [28], as has been reported by lucid dreamers [29].

In LDT, nightmare sufferers are taught to become lucid in their nightmare through various daily exercises. They can perform actions in the nightmare itself that alter the nightmare and its storyline (e.g. confront the attacker instead of fleeing). Although the beneficial effects of exposure and mastery on nightmares have been documented, reports on the effects of LDT have been scant. Only a few case studies have been conducted, but all have shown promising results [30–32].

A randomized controlled trial is necessary to evaluate LDT in a larger sample. This pilot study performed such a trial on a sample of chronic nightmare sufferers and evaluated the effects of LDT in an individual and a group session.

Methods

A nightmare was defined as a frightening dream that led to direct awakening [14].

Participants

Thirty nightmare sufferers were recruited by advertisements in newspapers. Seven participants were excluded, 3 because they suffered from night terrors, 2 because they suffered from hypnagogic hallucinations and 2 because they were on medication.

Seventeen participants were female, 6 were male. This is compatible with the finding that more women than men report experiencing nightmares [33]; the DSM-IV describes the ratio as within 2–4:1 [34]. However, women also have a higher dream recall [3, 35], which inevitably leads to a higher recall of nightmares. Mean sample age was 28.4 years (SD = 7.3). Seven participants had a university degree; all had a high school degree. No financial incentive was provided.

All 23 participants had suffered from nightmares for over 1 year (mean duration 12.4 years; SD = 4.7, at least once a week), and 13 (57%) reported having experienced at least one traumatic event in their lives. Only 4 had nightmares related to a traumatic event; 1 had been in psychotherapy for PTSD for 8 months (discontinued 5 months before the LDT), but still reported suffering from frequent posttraumatic nightmares. Based upon a validated sleep questionnaire [36], 9 participants had a co-morbid sleep disorder (insomnia or sleep apnea). Participants were asked about their medical and psychiatric histories, which revealed no co-morbid mental disorders, except for the 1 participant with PTSD.

Assessment

Nightmare frequency was measured by the SLEEP-50 [36], a new self-report instrument for assessing various sleep complaints and disorders with good reliability and construct validity. It showed good predictive validity for a broad range of sleep disorders when compared with polysomnographic and/or clinical diagnoses obtained in a sleep clinic: the overall agreement between clinical diagnoses and SLEEP-50 classifications was good. For nightmares, the sensitivity was 0.84 and the specificity was 0.77. The total score of the SLEEP-50 can be used as an indication of sleep quality.

The assessment of nightmare frequency, however, yields several problems. Polysomnographic recordings seem to decrease nightmare frequency [37] and cannot measure the subjective sleep quality. Retrospective methods for nightmare frequency with a relatively long-term duration (e.g. the last month or year) underestimate the frequency of nightmares [38], whereas nightmare sufferers may feel reluctant to keep prospective logs [16]. One study did not find an underestimation of nightmare frequency using a retrospective questionnaire with a shorter duration (e.g. previous 7 days) in comparison to a daily log [39]. Therefore we used the SLEEP-50 to assess the number of nightmares over the previous 7 days. In addition, at follow-up participants also had to estimate their average number of nightmares per week for the previous 12 weeks.

PTSD complaints were measured by the Self-Rating Inventory for PTSD (SRIP) developed by Hovens et al. [40]. The 22 items follow the PTSD symptoms as described in the DSM-IV [14] without special reference to a traumatic event. The reliability of the scale was good, and a sensitivity of 0.86 and a specificity of 0.71 were found in relation to the Clinician-Administered PTSD scale [40].

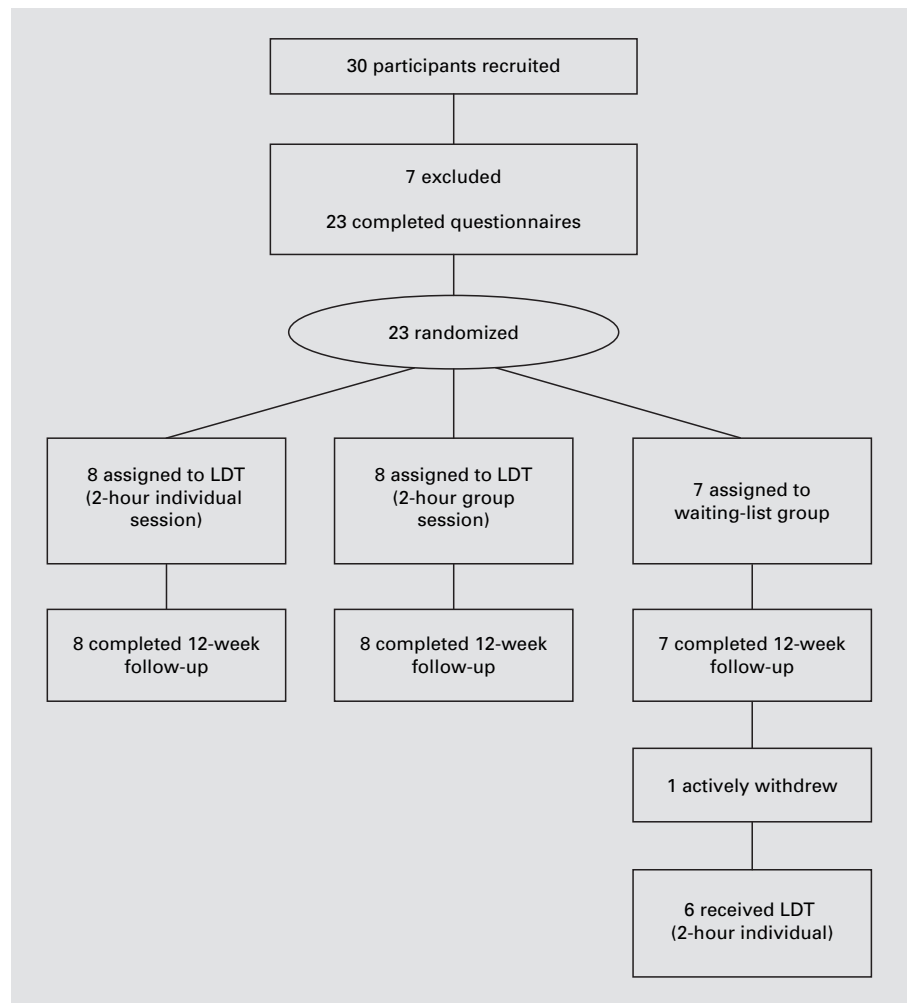


Fig. 1. Study flow chart.

The optimal cut-off score for PTSD is 52 (range SRIP: 22–88). However, SRIP item two (*having distressing dreams*) was left out of the total score so that a reduction in nightmare frequency would not automatically result in a reduction of the overall PTSD symptom level.

Procedure

All 23 participants received and returned the questionnaires by mail. They were randomized into three groups afterwards: 8 participants received one 2-hour individual LDT session (group A); 8 participants received one 2-hour group LDT session with a group size of 4 participants (group B), and 7 participants were placed on the waiting list and were told they would receive treatment in 12 weeks (group C) (fig. 1). Written consent was obtained after the procedure had been fully explained. At follow-up 12 weeks after the treatment, participants filled out the same questionnaires and additional questions about the treatment.

Treatment

All treatments (one 2-hour session) were conducted by the first author and consisted of a short introduction and general information about nightmares. It was explained that recurrent features of

the nightmares (e.g. common themes such as being chased or exact replication of a traumatic event) can trigger lucidity, and that this can be learned with specific exercises. Participants had to *intend* before going to bed that the next time they would be in the recurrent situation of the nightmare, they would realize that it was not real, but only a dream. A related exercise was imagining the recurrent situation while thinking that they were only dreaming. These exercises are comparable to exposure, but associating recurrent (nightmare) situations with lucidity is a unique feature of LDT.

After this, it was pointed out that every aspect of a lucid dream could be altered. Participants were asked to think about how to alter their nightmare(s). Various new endings were discussed and participants were encouraged to choose a constructive ending, also referred to as a ‘triumphant ending’ [41] (e.g. talking to or fighting the attacker instead of fleeing), since confrontation tends to make threatening dreams less intense [42]. Each participant eventually chose the ending he or she desired. This part of the treatment is comparable to IRT. One difference is that the participant does not mentally rehearse the changed version of the nightmare but should rather actively conduct the changes in the nightmare itself. Moreover, relaxation exercises commonly used in IRT are not part of LDT.

Table 1. Nightmare frequency, sleep complaints and PTSD complaints by treatment group at pre-intervention (T1) and follow-up (T2)

| Group | n | Nightmare frequency | | Sleep complaints | | PTSD complaints | |
|----------------|---|---------------------|------------------------|------------------|-------------|-----------------|------------|
| | | T1 | T2 | T1 | T2 | T1 | T2 |
| Individual LDT | 8 | 3.5 (1.7) | 1.4 (0.7) ¹ | 52.3 (9.9) | 53.1 (9.2) | 28.9 (4.8) | 26.4 (4.2) |
| Group LDT | 8 | 3.1 (2.0) | 2.6 (1.7) ² | 51.0 (8.3) | 49.7 (8.9) | 26.7 (5.1) | 26.1 (4.9) |
| Waiting list | 7 | 3.7 (2.4) | 3.6 (2.1) | 54.6 (8.8) | 52.1 (10.2) | 29.4 (5.3) | 29.7 (5.6) |

Results are expressed as means (SD).

¹ T1–T2 change significant at the 0.01 level (one tailed).

² T1–T2 change significant at the 0.05 level (one tailed).

We also explained that changing the nightmare might be difficult even if full lucidity is achieved. Should that occur, the participants would have to start off by making a minor change first, preferably changing a background object. Once accomplished, they could then pick a more important object, gradually extending this to the whole dream.

At all stages participants were encouraged to ask questions. Finally, homework assignments (the exercises) were handed out with a short summary of the treatment.

Statistical Analyses

The effects of the treatment were analyzed with paired t tests (one tailed). Differences between the three groups after randomization were tested for significance with χ^2 and Kruskal-Wallis non-parametric rank tests.

Results

There were no statistical differences between the three groups after randomization for education, age, nightmare frequency, sleep distress, and overall PTSD complaints (all p values were between 0.27 and 0.89). In addition, there were no differences between the three groups for gender, $\chi^2(2) = 1.1$, $p = 0.59$. There were no dropouts in any of the groups. The estimation of the average nightmare frequency per week (for the previous 12 weeks) correlated highly with the reported nightmare frequency for the previous 7 days, $r(21) = 0.89$, $p < 0.001$, although this 12-week average led to a significantly lower nightmare frequency: $t(22) = 2.5$, $p = 0.02$. Therefore, we used the reported number of nightmares over the previous 7 days at the pre-intervention and follow-up assessments.

A paired t test showed a significant reduction in nightmare frequency for participants who received an individual session, $t(7) = 4.1$, $p = 0.002$. A significant reduction was also found in nightmare frequency for participants

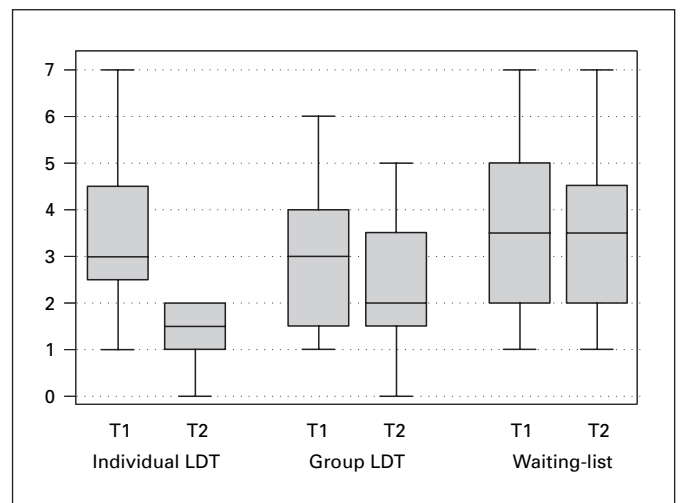


Fig. 2. Box plots of nightmare frequencies (number of nightmares over the previous 7 days) in the three groups at pre-intervention (T1) and follow-up (T2). Scores are divided into 4 quarters with the middle line as the median.

who took part in the group session, $t(7) = 2.6$, $p = 0.02$. No differences were found for the waiting list group, $t(6) = 0.6$, $p = 0.30$. There were no significant changes between pre-intervention and follow-up in sleep quality and overall PTSD symptoms for any of the groups (see table 1).

Of the participants who received an individual LDT session, 7 had fewer nightmares at follow-up (fig. 2). Only 4 of them had become lucid during a nightmare and had thus been able to alter the nightmare. For the other 3 participants, the nightmare content changed without lucidity. All participants in this group reported at follow-up that they had conducted the exercises at home for at least a month.

Of the participants who received a group LDT session, only 4 had fewer nightmares at follow-up. Two of them had been able to alter the nightmare during lucidity. Two persons in this group reported at follow-up that they had not conducted the exercises at home for at least a month.

Lucidity was absent in the waiting list group. One nightmare sufferer reported a spontaneous decrease in nightmare frequency.

Discussion

The current study has certain limitations. It was a pilot study with a small sample size and sufficient statistical power was therefore lacking. The small sample sizes made it impossible to analyze differences between the two treatment groups. Moreover, the small therapeutic dosage of LDT (one 2-hour session) may account for the modest amount of change in nightmare frequency. Follow-up data for a longer time period (e.g. 6 months, 1 year) were lacking. The value of using a waiting list group as a control group is debatable, as the effects of other therapeutic factors (e.g. amount of professional attention) were not controlled. LDT consists of several components (exposure, mastery, and lucidity) and the design of this study does not permit a conclusion about the primary therapeutic component.

LDT seemed effective in reducing nightmare frequency. In this pilot study with no dropouts, a single 2-hour session was sufficient for a significant reduction in nightmare frequency. However, participants who received individual LDT showed a higher decrease in nightmare frequency than participants who received group LDT. This suggests that other non-LDT factors (e.g. personal or professional attention) may have contributed to a reduction in nightmares as well. Future studies could use a mailed self-help manual [20] or an attention-controlled control group to minimize these factors.

Moreover, LDT targeted nightmares specifically. The sleep quality of the participants did not improve and the overall PTSD symptom level stayed at the same level for all groups. Here LDT differs from IRT since IRT has shown a reduction in PTSD complaints while improving sleep quality as well [18, 20, 21]. The low baseline of PTSD symptom severity in this study could explain the absence of a reduction in PTSD symptoms. Although more than half the participants indicated that they had experienced at least one traumatic event, only 4 participants had trauma-related nightmares and just 1 had a diagnosis of PTSD. The PTSD symptom severity in our

sample was comparable to norm values for healthy persons.

The role of lucidity in treating nightmares is unclear, since only 6 of 16 participants were able to become lucid during a nightmare and then alter its course. Five participants experienced a reduction of and possible changes in the nightmares without lucidity, a finding that has also been reported in previous studies [31, 32]. Lucidity is a unique component of LDT: both IRT and LDT consist of exposure and mastery exercises, albeit in different forms. Future research should focus on what lucidity adds to cognitive restructuring treatment; LDT and IRT could be compared by linking the altered version of the nightmare with lucidity (by means of a reality test) in the LDT group.

Moreover, studies need to focus on the synergistic effects between restructuring and exposure. Although restructuring the nightmare (mastery) has been suggested to be crucial [21, 23, 24, 31, 32], evidence for this statement is scant. Only one recent study has indicated that restructuring the nightmare may be the primary therapeutic component of IRT [43]. In this study, which was part of a larger treatment study of posttraumatic nightmares [24], participants were instructed to mentally rehearse the changed version of the nightmare while avoiding direct exposure to the original nightmare as much as possible. A standardized content analysis [44] of the original and new (changed) versions of the nightmares showed that the new versions had more positive and mastery elements, leading the authors to conclude that 'mastery may constitute the core therapeutic component of IRT' [43]. Experimental evidence, however, is needed. To investigate whether restructuring enhances the effects of exposure, future research should compare exposure and restructuring techniques by instructing participants to rehearse either the original nightmare or the altered version of the nightmare with similar exercises.

In conclusion, a single 2-hour session of LDT led to a modest but significant reduction in nightmare frequency. The absence of dropouts in the study strengthens this finding. The LDT session did not affect sleep quality or PTSD symptom severity, however. Future studies need to evaluate whether LDT works through exposure, mastery, lucidity, or a combination of these components.

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