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Treatment of Nightmares in Psychiatric Inpatients With Imagery Rehearsal Therapy: An Open Trial and Case Series

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Objectives: This study sought to assess the utility of Imagery Rehearsal Therapy (IRT) for nightmares in an inpatient psychiatric setting. Although IRT enjoys a substantial evidence base for efficacy in various populations, data with psychiatric inpatients are lacking. *Participants*: Participants were 20 adult psychiatric inpatients (11 male, 9 female; mean age=43.4), in an extended stay psychiatric inpatient facility. All participants were diagnosed with multiple, treatment resistant, comorbid conditions, including mood disorders, anxiety disorders, personality disorders, and substance-related disorders. Patients with active psychosis or significant cognitive impairment were excluded. *Methods*: This was an open trial utilizing a case series design. In addition to routine hospital treatment that included psychotherapeutic and pharmacological interventions, participants received IRT over a span of 3 weeks in 4 small group sessions. Included were education about sleep and nightmares, instruction in writing new dream narratives and practicing guided imagery, and support via further consultation and trouble-shooting. Patients were referred by their psychiatrist or were self-referred, with approval from their treatment teams. *Results*: Results showed significant aggregate reductions in nightmare frequency and intensity, as well as improvement in sleep overall. Patients also improved on a variety of other symptom measures, including suicidal ideation. No adverse reactions were observed. The present report includes a sampling of individual case vignettes to illustrate variability in treatment response. *Conclusions*: This study provides preliminary evidence that IRT can be used safely and effectively in a hospital environment to benefit patients suffering from serious mental illnesses, often in the midst of significant life crises. It is not possible in this preliminary study to conclude that IRT specifically (as opposed to other aspects of hospital treatment) produced these outcomes. Larger, controlled trials are needed to establish a causal connection between IRT and nightmare reduction.

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Persistent nightmares constitute a common sleep-related disorder (American Academy of Sleep Medicine, 2014) that may exist as a freestanding disorder or in the context of a psychiatric disorder (American Psychiatric Association, 2013). The prevalence of chronic nightmares in the general population is typically reported in the range of 4–5%, but may occur in as many as 88% of individuals with psychiatric disorders (Forbes, Phelps, & McHugh, 2001). The prevalence of nightmares has been found to be consistent across several countries and cultures, including the United States, Canada, Europe, Japan, and the Middle East (Levin & Nielsen, 2007).

Though often viewed as merely a nuisance, nightmares can have profound adverse effects on the sufferer. In addition to awakening the individual during the sleep cycle, nightmares may also make it difficult to return to sleep. Additionally, patients with clinically significant nightmares commonly report resisting sleep in order to avoid nightmares (American Academy of Sleep Medicine, 2014). Due to the REM rebound effect, such sleep interruption commonly serves only to make nightmares worse.

Nightmares function both as a symptom and as an exacerbating factor with respect to several distinct mental health disorders (Nadorff, Lambdin, & Germain, 2014). For instance, nightmares are strongly associated with posttraumatic stress disorder (PTSD); indeed, research has shown that nightmares may persist for as long as 50 years after a traumatic experience (Guerrero & Crocq, 1994; Kaup, Ruskin, & Nyman, 1994). Furthermore, in addition to occurring subsequent to a trauma, research has shown that the presence of nightmares *prior to* a traumatic experience increases one's risk of developing PTSD following the experience (Bryant, Creamer, O'Donnell, Silove, & McFarlane, 2010; Ohayon & Shapiro, 2000). Other conditions with which nightmares are associated include generalized anxiety disorder (Nadorff, Porter, et al., 2014), symptoms of depression and anxiety (Levin & Nielsen, 2007; Nadorff, Nazem, & Fiske, 2013), dissociative disorders (Agargun et al., 2003), and borderline personality disorder (Hartmann, Russ, van Der Kolk, Falke, & Oldfield, 1981; Semiz, Basoglu, Ebrinc, & Cetin, 2008).

Nightmares also have been found to be a unique predictor of suicidal ideation and behavior. Nightmares are associated with suicidal thoughts (Cukrowicz et al., 2006), attempts (Sjöström, Hetta, & Waern, 2009), and death by suicide (Tanskanen et al., 2001), *independent of psychiatric diagnosis and symptomatology*. Nightmares have been shown to explain unique variance in suicide risk with respect to depression, anxiety, and PTSD (Nadorff, Nazem, & Fiske, 2011). Nightmares also are associated with suicide attempts independent of depression, anxiety, PTSD, substance use (Sjöström et al., 2009; Sjöström, Waern, & Hetta, 2007), and aspects of Joiner's Interpersonal-Psychological Theory of Suicide (Nadorff, Anestis, Nazem, Harris, & Winer, 2014). Thus, persistent nightmares, more than a mere symptom of psychiatric illness, constitute a clinically relevant disorder in their own right, worthy of treatment.

Both pharmacological and psychological therapies have been introduced to treat nightmare disorder (Aurora et al., 2010), although they are generally underutilized (Nadorff, Nadorff, & Germain, 2015). There is a substantial literature supporting several different treatments for nightmares, with prazosin (a sympatholytic drug typically used for high blood pressure and anxiety) and Imagery Rehearsal Therapy (IRT) having the strongest empirical support. (For recent reviews, see Augedal, Hansen, Kronhaug, Harvey, & Pallesen, 2013; Hansen, Höfling, Kröner-Borowik, Stangier, & Steil, 2013; Kung, Espinel, & Lapid, 2012; Nadorff, Lambdin, & Germain, 2014).

Among the psychotherapeutic treatments for nightmares, IRT has the strongest empirical support. IRT is a cognitive-behavioral intervention in which a client "rescripts" the nightmare

however he or she desires and then practices the new dream using visual imagery. Since the dream can be changed in any way, including not containing material from the original disturbing dream, IRT is not generally considered an exposure-based therapy (Hansen et al., 2013).

Imagery rehearsal therapy has been used successfully in a variety of settings. Krakow and colleagues (Krakow et al., 2001) utilized IRT with adolescent females at a boarding school who had significant histories of unwanted sexual experiences. Treatment with IRT led to a 57% decrease in nights with nightmares and the overall number of nightmares per month declined by 71%. IRT has also been tested in a sample of Australian Vietnam veterans who had previously been treated for PTSD but still had at least one trauma-related nightmare per week. Outcomes included moderate reductions in nightmare frequency (d = 0.70) and intensity (d = 0.55), with modest reductions in symptoms of depression (d = 0.43) and anxiety (d = 0.20; Forbes et al., 2003). In a subsequent larger sample of veterans, Nappi and colleagues (Nappi, Drummond, Thorp, & McQuaid, 2010) found that IRT reduced nightmare frequency (d = 0.45), nightmare severity (d = 0.81), insomnia symptoms (d = 0.72), and PTSD symptoms, (d = 1.03).

Finally, in a recent controlled clinical trial, van Schagen and associates (van Schagen, Lancee, de Groot, & van den Bout, 2015) randomized a sample of 90 adult outpatients to either treatment as usual supplemented with six individual sessions of IRT, or treatment as usual only. They found significantly greater improvement in the IRT group, with moderate effect sizes on nightmare frequency, nightmare distress, and psychopathology measures. The between-groups differences were sustained at three-month follow-up.

Such promising findings notwithstanding, to our knowledge, IRT has not as yet been evaluated in an inpatient psychiatric setting. This is noteworthy, as psychiatric inpatients are likely to have multiple comorbid conditions and more severe psychopathology than participants who have taken part in previous studies. Psychiatric inpatients have more severe mental disorders (Way, Evans, & Banks, 1992), previous histories of hospitalization (Pottick, Hansell, Gutterman, & White, 1995), and require more intensive treatment (Pallak & Cummings, 1992). Moreover, psychiatric inpatients typically are in a crisis state, unable to function in their normal environments, and sometimes are so unstable that they constitute a danger to their own survival. The urgency and complexity of this situation necessitates a multimodal response, including biological, social, and psychological interventions, resulting in a sometimes crowded treatment agenda. The question of whether an intervention targeting nightmares (a clinically significant though nonurgent symptom) is viable or realistic in this context is an important one.

A related issue in this discussion is the association between nightmares and suicide risk. The elevated risk of suicide among psychiatric inpatients is well documented (Bowers, Banda, & Nijman, 2010), as is the association between nightmares and suicidality (Bernert, Joiner, Cukrowicz, Schmidt, & Krakow, 2005; Cukrowicz et al., 2006). However, research has yet to examine whether treating nightmares might also be associated with a reduction in suicidal ideation. Although not directly focused on nightmares, research by two of the authors (TE and MN) in the current setting has indicated that a lack of resolution of sleep problems over the course of inpatient treatment is associated with less complete recovery from suicidal ideation (Nadorff, Ellis, Allen, Winer, & Herrera, 2014). However, it is unknown whether treating sleep disturbances leads to more complete recovery. Thus, research examining the feasibility and implementation of Imagery Rehearsal Therapy on an inpatient unit is warranted.

The present study's primary aim was to evaluate the use of IRT in an inpatient psychiatric setting. Based on prior research, we sought to determine whether treatment with IRT would be associated with (a) reductions in nightmare frequency and severity, and (b) lower levels of insomnia symptoms relative to pretreatment baselines. Additionally, as an exploratory aim, we sought to assess whether improvement in nightmare status might be associated with concomitant improvement in suicidal ideation scores relative to baseline.

METHOD

Setting

The Menninger Clinic is a private, not-for-profit, 90-bed psychiatric hospital in Houston, Texas. The great majority of patients at Menninger are diagnosed with multiple comorbid psychiatric disorders, notably mood and anxiety disorders, substance-related disorders, and personality disorders; approximately half have histories of suicidal ideation or behaviors. Most patients are referred following unsatisfactory response to prior medical or psychological interventions. Approximately 60% of patients are from outside of Texas. The treatment program includes general medical care, pharmacotherapy, physical activities, twice-weekly individual and group psychotherapy, daily psychoeducational groups, family work, and leisure-time social or recreational activities. These interventions are employed in the context of a therapeutic milieu that includes continuous nursing care as well as patient government and ample opportunity for spontaneous interactions among patients. Patients in the present study were from two of the adult units, the Professionals in Crisis program (PIC) and HOPE, a program for adults with relatively chronic disorders.

Participants

The present study included 20 participants, 11 (55%) males and 9 (45%) females, ranging in age from 24 to 62 years (M = 43.40, SD = 11.27). A large majority (90.0%) was white. Most had received higher education; 20% reported bachelor degrees, 20% reported master's degrees, and 35% reported professional degrees. The average length of stay for the present sample was 60.2 days (skewed by 2 outliers with lengths of stay slightly over 100 days). Criteria for inclusion in the study required only that patients were self-reporting nightmares that were causing sleep disruption or significant emotional distress. Patients were excluded if they were currently experiencing symptoms of psychosis or cognitive impairment that would interfere with understanding or participation in the program.

Procedures

This study was approved by the Institutional Review Board of Baylor College of Medicine. Patients entered the study either referred by treatment teams or via self-referral after IRT availability was announced on the units. Patients were informed that enrollment in the study was not a condition of participation in IRT, although none declined participation after receiving information about the study. Written informed consent was employed. The IRT intervention was

provided in small groups consisting of three to six patients; two of the authors (TE and KR, both doctoral level psychologists) served as study therapists.

The intervention was a modified version of the IRT protocol developed by Krakow and associates (Krakow, Kellner, Pathak, & Lambert, 1995), as implemented by Germain at the University of Pittsburgh (A. Germain, personal communication). To accommodate hospital scheduling and limited time availability due to hospital length of stay, we divided content into four 1-hr sessions, the first two during the first week, the remaining two at one-week intervals thereafter. Session 1 provided general education regarding nightmares and sleep in general, an overview of IRT and its rationale, and distribution of homework reading material. Session 1 homework consisted of reading material that provided additional details on the rationale and procedures of IRT and maintaining a daily record of nightmares and levels of distress (instructions on its use provided). Session 2 (approximately three days after Session 1) provided guidance and opportunity to write a brief narrative of the "target" nightmare, time and guidance for writing a "re-scripted" dream, and an experiential exercise demonstrating vivid imagery. For homework, patients were instructed to engage in imagery rehearsal twice per day for 10 min, keeping a record of minutes of practice per day, as well as continuing to record nightmares and levels of distress daily. Session 3 (one week later) consisted of group discussion of patient experiences with imagery practice, making appropriate modifications in their imagery practice as symptoms changed, and any other issues or questions as they arose. Session 4 was an abbreviated session to discuss any further questions or issues and to complete posttreatment inventories.

Primary Outcome Measures

Disturbing Dreams and Nightmare Severity Index

The Disturbing Dreams and Nightmare Severity Index (DDNSI) was developed as a measure of nightmare frequency and severity (Krakow et al., 2002). It measures nightmare frequency by asking about the number of nights with bad dreams or nightmares per week (0–7 nights) and the number of total bad dreams or nightmares per week (up to 14). The DDNSI also measures the severity and intensity of the bad dreams and nightmares on a Likert-type scale, ranging from not intense to extremely severely intense, as well as how often nightmares result in awakenings, ranging from *never/rarely* to *always*. A sample item is, "How would you rate the severity of your disturbing dreams and/or nightmare problem?" with options ranging from 0 for "No Problem" to 6 for "Extremely Severe Problem." A score greater than 10 is viewed as indication of nightmare disorder (Krakow et al., 2002).

Insomnia Severity Index

The Insomnia Severity Index (ISI) is a 7-item self-report measure that assesses insomnia symptoms over the previous two weeks (Bastien, Vallières, & Morin, 2001). The first three items rate difficulty falling asleep, staying asleep, and waking up too early on a 4-point scale. Each subsequent item is scored on a 0–4 scale, with total scores ranging from 0–25. A sample item is, "To what extent do you consider your sleep problem to INTERFERE with your daily functioning?" with options ranging from 0 for "Not at all Interfering" to 4 for "Very much Interfering." The ISI has been shown to have adequate test–retest

reliability over three months and concurrent validity with sleep diaries and polysomnography (Bastien et al., 2001; Savard, Savard, Simard, & Ivers, 2005). A score of 15 or greater is considered indicative of clinical insomnia.

Columbia Suicide Severity Rating Scale

The Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011) is a clinician-administered rating scale measuring past and current suicidal ideation and behavior. It measures four constructs: severity, intensity, behavior, and lethality. Ideation frequency, duration, and controllability are summed for an index of ideation severity (utilized in the current study). The C-SSRS has shown excellent internal reliability and good convergent, divergent, and predictive validity (Madan et al., 2016; Posner et al., 2011).

Outcomes were compared pre- and posttreatment on the DDNSI and ISI using paired samples *t*-tests. Analyses were conducted using SPSS Version 23.

AGGREGATE OUTCOMES

Results indicated significant improvement in both nightmares and sleep. With regard to nightmares, mean total scores on the DDNSI fell from 10.47 to 6.50, with a large effect size ($t[17] = 5.335$, $p < .001$, Cohen's $d = 1.37$). All DDNSI items showed significant change; participants indicated that nightmare severity significantly decreased from pre- ($M = 3.72$; $SD = 1.18$) to post- ($M = 2.44$; $SD = 1.25$) treatment ($t[17] = 4.808$, $p < .001$, Cohen's $d = 1.05$). Similarly, nightmare intensity significantly decreased from pre ($M = 4.17$; $SD = 1.18$) to post ($M = 2.44$; $SD = 1.25$) treatment ($t[17] = 4.850$, $p < .001$, Cohen's $d = 1.48$) as well. Lastly, participants reported that they were significantly less likely to wake up from nightmares following treatment ($M = 1.67$; $SD = 1.28$) compared to pretreatment ($M = 2.61$; $SD = 1.09$; $t[17] = 2.718$, $p < .05$, Cohen's $d = .79$).

Results also indicated significant improvement in sleep, with the mean ISI score falling from 15.90 to 8.50 ($t[19] = 6.794$, $p < .001$, Cohen's $d = 1.37$). On individual ISI items, patients reported less difficulty falling asleep ($t[19] = 5.082$, $p < .001$, Cohen's $d = .94$) and staying asleep ($t[19] = 3.596$, $p < .01$, Cohen's $d = .90$), as well as less difficulty with waking up too early ($t[19] = 4.721$, $p < .001$, Cohen's $d = 1.12$) and less interference in their daily functioning due to sleep problems ($t[19] = 3.758$, $p < .001$, Cohen's $d = .87$). Posttreatment, participants also reported a significant increase in sleep satisfaction ($t[19] = 3.866$, $p < .01$, Cohen's $d = .97$), felt their sleep problems were significantly less noticeable to others ($t[19] = 5.140$, $p < .001$, Cohen's $d = 1.29$), and reported significantly less worry regarding their sleep ($t[19] = 3.929$, $p = .01$, Cohen's $d = 1.09$).

Finally, there was indication of significant decreases in suicidal ideation among participants over the course of hospitalization. Suicide ideation intensity, as measured by the C-SSRS, decreased significantly from admission to discharge ($t[17] = 7.466$, $p < .001$), with a large effect size (Cohen's $d = 1.71$). Please see Table 1 for outcome means and standard deviations on all measures.

TABLE 1
Outcome Means and Standards Deviations Pre- and Posttreatment

	Pretreatment (N = 20)	*Posttreatment (N = 20)*	*Cohen's d*
	M (SD)	*M (SD)*	
C-SSRS Total	13.28 (7.87)	2.11 (4.87)	1.71
DDNSI Total	10.47 (2.61)	6.50 (3.15)	1.37
Nightmare Severity	3.72 (1.18)	2.44 (1.25)	1.05
Nightmare Intensity	4.17 (1.10)	2.39 (1.29)	1.48
Nightmare Waking	2.61 (1.09)	1.67 (1.28)	.79
ISI Total	15.90 (5.79)	8.50 (5.02)	1.37
Difficulty Falling Asleep	2.00 (1.34)	0.90 (0.97)	.94
Difficulty Staying Asleep	2.40 (1.00)	1.50 (1.00)	.90
Problem Waking Too Early	2.00 (1.16)	0.85 (0.88)	1.12
Interference in Daily Function	2.30 (0.92)	1.40 (1.14)	.87
Satisfaction with Sleep Pattern	2.65 (0.93)	1.70 (1.03)	.97
Noticeable to Others	2.00 (1.12)	0.75 (0.79)	1.29
Worry	2.55 (1.00)	1.40 (1.10)	1.09

Note: C-SSRS = Columbia Suicide Severity Rating Scale; DDNSI = Disturbing Dream and Nightmare Severity Index; ISI = Insomnia Severity Index.

SAMPLE CASES

Notwithstanding evidence of overall beneficial effects of IRT, considerable variability in results among individual patients was noted. The following cases were selected to provide examples of patient histories and responses to treatment. (Cases have been significantly disguised to protect patient privacy.) As noted above, in addition to the IRT intervention, all patients also received individual and group psychotherapy, medication management, nursing care, case management, family counseling, and education via psychoeducational groups, in addition to participation in a therapeutic milieu. Clinical features and outcomes are shown in Table 2; as indicated, secondary outcome measures included the Patient Health Questionnaire-9 (PHQ-9; Spitzer, Kroenke, & Williams, 1999), GAD-7 (Spitzer, Kroenke, Williams, & Löwe, 2006), Difficulties with Emotion Regulation (DERS; Gratz & Roemer, 2004), and World Health Organization Disability Assessment Scale (WHO-DAS; World Health Organization, 2010).

Patient #1

Clinical history

"Mr. Collins" was a 40-year-old male administrator who was admitted to the hospital with a history of chronic depression and suicidal ideation dating back to his early teens. His nightmares were associated with a history of family instability, neglect, and emotional abuse. His treatment history included multiple prior psychiatric hospitalizations and one suicide attempt. Prior treatments

TABLE 2
Individual Cases: Clinical Features and Pre- and Post- Outcomes

	Patient #1		*Patient #2*		*Patient #3*		*Patient #4*		*Patient #5*		*Patient #6*	
Demographics	40, male, never married BA degree in marketing Mixed work history		39, female Graduate degree Unemployed past 15 years		52, male physician		54, male married dentist		49, male married high school education business owner		40, female divorced master's degree Working on PhD	
Diagnoses, clinical presentation	MDD, recurrent 8 prior hospitalizations		Bipolar I, PTSD 10+ prior hospitalizations Chronic suicidal ideation w/o intent		MDD, recurrent GAD AvPD, OCPD 1 prior hospitalization		MDD, recurrent Anxiety disorder NOS involuntary hospitalization		MDD, recurrent AvPD, BPD Dysthymic disorder No SI 20-year history of depression		Bipolar, other OCD, GAD OCPD, SA 25-year history of depression	
Hospital course	"Some improvement" noted by treatment team		"Significant improvement" noted by treatment team		Improvement noted, but patient complained about "not making more progress"		Adjusted well, leadership role. D/C prematurely after difficult interaction with wife		Well-engaged in treatment Significant improvement observed		"Dramatic" improvement in depression and anxiety Progress in emotional regulation	
	Pre	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Pre*	*Post*
ISI	15	14	24	13	10	6	12	5	22	9	19	13
DDNSI	8	8	13	9	8	8	12	6	10	9	9	11
C-SSRS	23	12	22	12	13	0	20	0	15	0	25	14
PHQ-9	20	19	25	2	24	3	17	1	27	6	25	8
GAD-7	13	0	17	1	15	4	19	1	20	6	11	7
DERS	126	90	129	51	136	78	70	53	120	82	121	91
WHO-DAS	19	6	0	0	29	6	14	1	28	14	36	24

Note. MDD = major depressive disorder; PTSD = posttraumatic stress disorder; GAD = generalized anxiety disorder; AvPD = avoidant personality disorder; OCPD = obsessive-compulsive personality disorder; SI = suicidal ideation; NOS = not otherwise specified; SA = substance abuse; ISI = Insomnia Severity Index; DDNSI = Disturbing Dream and Nightmare Severity Index; C-SSRS = Columbia Suicide Severity Rating Scale; PHQ-9 = Patient Health Questionnaire-9 (depression); PHQ-7 = Patient Health Questionnaire-7 (anxiety); DERS = Difficulties with Emotional Regulation Scale; WHO-DAS = World Health Organization–Disability Assessment Scale.

included electroconvulsive therapy, transcranial magnetic stimulation, and various regimens of medication and therapy.

Treatment course

General outcome measures indicated significant reductions in anxiety and emotional dysregulation; his suicidal ideation, while reduced, showed incomplete resolution, and his moderately severe depression showed little movement. His response to IRT was likewise modest; while he reported a steady decrease in nightmare frequency (he reported none during the final week of treatment), intensity of nightmares when they did occur remained in the moderate range. Mr. Collins's scores on the ISI and DDNSI were essentially unchanged at the conclusion of treatment.

Patient #2

Clinical history

"Ms. Phillips" was a 39-year-old divorced female, who was admitted to the hospital following a long history of multiple psychiatric disorders, including bipolar affective disorder (Type 1), anorexia nervosa, PTSD, and numerous medical conditions, including irritable bowel syndrome and migraine headaches. Her history also included multiple prior suicide attempts and psychiatric hospitalizations.

Treatment course

Over the course of hospitalization, Ms. Phillips experienced dramatic reductions in depressive and anxiety symptom severity, which declined into normative ranges. Her score on the C-SSRS fell from 22 to 12. Nightmare frequency and intensity decreased over the course of treatment as well, from five total nightmares during the first week to two during the final week (both rated moderate in severity). Her scores on the DDNSI and ISI both decreased into normative ranges. She reported high satisfaction with IRT, which provided relief that she had not obtained from pharmacotherapy (prazosin).

Patient #3

Clinical history

"Dr. Greene" was a 52-year-old married male physician who was admitted to the hospital following the worsening of depressive illness that he traced back to childhood. He had experienced steadily worsening depression following a job-related relocation, and was no longer responding to outpatient treatment. He reported wishing to die when his depression was especially severe, but consistently denied active plans to kill himself.

Treatment course

While hospitalized, Dr. Greene participated actively in treatment, and his symptom measures showed dramatic improvement, with scores falling into normative ranges. He initiated enrollment in

IRT upon hearing it announced on his unit. He reported two nightmares during the first week of IRT, both rated in the severe range. He expressed enthusiasm for the IRT approach, and reported immediate results, indicating no further nightmares following the initiation of IRT. His DDNSI score did not change, due in part to the fact that his baseline score was in the subclinical range.

Patient #4

Clinical history

"Dr. Williams" was a 54-year-old married male dentist who was admitted to the hospital following an aborted suicide attempt with a firearm in the context of severe marital discord. He reported a prior suicide attempt during a depressive episode in his mid-20s, also associated with marital discord and resulting in hospitalization.

Treatment course

Dr. Williams participated actively in treatment and requested IRT due to recurrent nightmares. He showed normalization on all symptom measures. Despite seeking discharge prematurely, his nightmares dropped over the course of hospitalization from three to four per week to one (rated mild), and his scores on the DDNSI and ISI dropped to within normal limits.

Patient #5

Clinical history

"Mr. White" was a 49-year-old married male with a high school education, who had found success as a business owner. He was admitted to the hospital following a significant exacerbation in depression and anxiety that dated back to his abusive childhood. Although he denied suicidal intent, he did report occasional episodes of intentional self-injury during periods of extreme anxiety. This hospitalization was his first. Admission diagnoses included major depression, dysthymic disorder, and avoidant personality disorder. Lifelong sleep problems, made worse by his depression, were a significant aspect of his clinical presentation. Admission diagnoses included major depressive disorder, PTSD, and avoidant personality disorder.

Treatment course

Mr. White participated actively in the treatment program, although he struggled with strong affect evoked by therapeutic work on his childhood trauma. Sleep improved significantly over the course of IRT, with his ISI score dropping from 22 to 9. Self-reported nightmares decreased in frequency, though not intensity, with only a 1-point drop in his DDNSI score. Mr. White reported six nights with nightmares in the week prior to IRT participation; in the second week, he reported three nights with nightmares, all rated as severe. In the final week of treatment, Mr. White reported three nights with nightmares, rated as severe. Notably, this final week ended with four consecutive nights without nightmares.

Patient #6

Clinical history

Ms. Moore was a 40-year-old divorced female graduate student, who was admitted to the hospital following a high-lethality suicide attempt. She reported a history of depression dating back to adolescence, four previous psychiatric hospitalizations, and three prior suicide attempts. Her childhood history included several years during which she reports "constant fear" in response to her parents' expressed conviction that the world would soon be coming to an end.

Treatment course

Ms. Moore showed significant symptom improvement, though not without indication of residual depressive and anxiety symptoms at discharge. Likewise, her suicidal ideation, while significantly diminished, remained elevated as well. Her IRT trajectory exhibited an undulating course, with gradual diminishment in frequency and intensity. During the first week of IRT, Ms. Moore reported four nights with a total of eight nightmares. Four were rated as mild and four were rated as moderate severity. During the second week, she reported five nights with a total of eight nightmares. Of these nightmares, five were rated as mild, two as moderate, and one was rated severe. In the final week of treatment, Ms. Moore reported one night with one nightmare, rating the severity as mild. The severity of her suicidal ideation was observed to correspond with her nightmares, with an exacerbation in both near the midpoint of her treatment.

DISCUSSION

Results of this open trial with 20 psychiatric inpatients suggest the viability of imagery rehearsal therapy in an inpatient setting, solid effectiveness, and low risk, as indicated by the absence of adverse outcomes. This is the first study of which we are aware that evaluates the use of IRT in a hospital environment. Aggregate results were equivalent or larger than those reported in other trials from outpatient settings (such as van Schagen et al., 2015), and in contrast to findings that might predict more modest outcomes with individuals with multiple chronic and severe comorbid conditions (Bock, Bukh, Vinberg, Gether, & Kessing, 2010; Tyrer & Simmonds, 2003).

Clinically this study shows notable variability in outcomes among individual cases. It is not possible in a study of this nature to fully explain this variability, except to note that IRT results tended to mirror those of patients' treatment in general. That is, patients whose course of treatment in general went well tended to show greater reductions in nightmare activity, whereas patients whose response to hospitalization was more limited also tended to show less complete resolution of nightmares. In addition, it should be noted that this was a relatively brief exposure to IRT (4 sessions over 3 weeks); although the dose-response relationship of IRT has not yet been established, other studies have tended to use protocols with more sessions over longer periods of time. (Such protocols often include coverage of sleep hygiene and interventions associated with cognitive-behavior therapy for insomnia.)

It also is not possible with this study design to establish a causal connection between the IRT intervention and changes in nightmare activity or suicidality. In other words, it is entirely possible that patients' nightmares and suicidal ideation would have decreased anyway, in

response to medication and other forms of treatment addressing depressed mood, anxiety, and other symptoms. However, with respect to nightmares, it should be noted that these patients typically entered IRT after having already received prazosin, psychotherapy, and other interventions, without satisfactory impact on their nightmares. Whether the apparent effect of IRT occurred as a result of placebo effect is another matter that cannot be resolved in an uncontrolled trial. However, other trials, in which participants were randomized to IRT versus placebo conditions, have shown efficacy beyond placebo effects alone (van Schagen et al., 2015).

Open trials like this are associated with limitations that should be noted. As indicated above, without a control group for comparison, it is not possible to claim that these patients' progress was any different than what they would have experienced with hospital treatment as usual. In addition, the use of self-report measures (rather than clinician ratings, polysomnography, or standardized sleep diaries) creates the possibility of social desirability responding and other sources of measurement bias. Finally, without posttreatment follow-up data, it is not possible to know to what extent treatment effects were durable.

To address these limitations, future studies of IRT in inpatient settings should establish controls for possible confounds through randomization or propensity score matching, as well as supplementing patient self-report by clinical measures employed by raters blind to treatment condition. In addition, larger samples will be needed to establish relationships between treatments and outcomes, as well as various predictors of outcomes.

In sum, the present study suggests considerable promise for the use of IRT with psychiatric inpatients. The lack of adverse outcomes is of particular interest, suggesting that the addition of this treatment did not overload patients experiencing significant symptom burden and who were in crisis states and already participating in an intensive, immersive treatment program. The statistical significance of pre–post differences also is of interest, considering the small sample size. Finally, the surprisingly large effect sizes with this population, relative to studies of less severely ill samples, is noteworthy. Further investigation will be required to determine whether this finding will be replicated and can be generalized to other inpatient settings.

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