

Bad Dream Frequency in Older Adults With Generalized Anxiety Disorder: Prevalence, Correlates, and Effect of Cognitive Behavioral Treatment for Anxiety

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This study investigated the relation between generalized anxiety disorder (GAD) and frequency of bad dreams in older adults. A secondary analysis from a randomized clinical trial comparing cognitive behavioral therapy (CBT) for anxiety to enhanced usual care (EUC) assessed bad dream frequency at baseline, post treatment (3 months), and at 6, 9, 12, and 15 months. Of 227 participants

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(mean age = 67.4), 134 met GAD diagnostic criteria (CBT = 70, EUC = 64), with the remaining 93 serving as a comparison group. Patients with GAD had significantly more bad dreams than those without, and bad dream frequency was significantly associated with depression, anxiety, worry, and poor quality of life. CBT for anxiety significantly reduced bad dream frequency at post treatment and throughout follow up compared to EUC.

Nightmares and bad dreams are overlapping and common forms of parasomnia. Nightmares are vivid, disturbing, or frightening dreams that cause a startled awakening (Levin & Nielsen, 2007), and bad dreams are “very disturbing dreams which, though being unpleasant, do not cause the dreamer to awaken” (Robert & Zadra, 2008, p. 133). There is a lack of consensus in the literature as to whether nightmares and bad dreams are, in fact, separate phenomena. Levin and Nielsen (2009) conceptualized both bad dreams and nightmares together in the same theory because “it remains unknown whether they (nightmares and bad dreams) are two qualitatively distinct phenomena or a single phenomenon varying in intensity” (p. 84). Despite this debate, it is clear that bad dreams and nightmares share many traits, including that both are caused by vivid, disturbing, and frightening dreams, which are the focus of this study.

Nightmares have significant clinical relevance. Although nightmares are perhaps best known as a defining symptom of posttraumatic stress disorder (PTSD), they are also the key feature of nightmare disorder, which has many significant comorbidities (American Psychiatric Association [APA], 2000). Nightmares are associated with symptoms of anxiety (Haynes & Mooney, 1975; Hersen, 1971; Levin & Fireman, 2002; Nielsen et al., 2000; Zadra & Donderi, 2000), depression (Levin & Fireman, 2002; Nadorff, Nazem, & Fiske, 2011), schizophrenia (Hartmann, 1981; Hartmann, Russ, Oldfield, Sivan, & Cooper, 1987), dissociative disorders (Agargun et al., 2003; Semiz, Basoglu, Ebrinc, & Cetin, 2008), borderline personality disorder (Hartmann, 1981; Claridge, Davis, Bellhouse, & Kaptein, 1998; Semiz et al., 2008), and even suicidal behavior (Cukrowicz et al., 2006; Nadorff et al., 2011; Sjöström, Hetta, & Wærn, 2009; Sjöström, Wærn, & Hetta, 2007; Tanskanen et al., 2001). Thus, it is clear that disturbing dreams are common in many different types of psychopathology. However, the effect of nightmares extends beyond those disorders. For example, 60% of individuals who developed PTSD reported having nightmares prior to the trauma (Ohayon & Shapiro, 2000), suggesting that the presence of nightmares may increase the risk of developing PTSD. In a similar vein, the presence of nightmares among suicide attempters increased the risk of future suicide attempts fourfold over a 2-year period after controlling for several *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev. [DSM-IV-TR]; APA, 2000) Axis I disorders (Sjöström et al., 2009). Nightmares also are associated with lower levels of well-being (Zadra & Donderi, 2000) and greater cognitive deficits (Simor, Pajkossy, Horváth, & Bódizs, 2012). Thus, nightmares have effects outside of the psychiatric disorders in which they are often comorbid, suggesting that nightmares are in and of themselves clinically relevant.

Due to the negative consequences of nightmares, and their relation with many psychological symptoms and disorders, a growing literature has examined nightmare treatment in children (St-Onge, Mercier, & De Koninck, 2009), adolescents (Krakow, Sandoval, et al., 2001), young adults (Cellucci & Lawrence, 1978; Germain & Nielsen, 2003; Miller & DiPilato, 1983; Spoomaker & van den Bout, 2006), middle-aged adults (Burgess, Gill, & Marks, 1998; Krakow, Hollifield, et al., 2001; Krakow et al., 2000; Krakow, Johnston, et al., 2001; Neidhardt, Krakow, Kellner, & Pathak, 1992), and veterans (Forbes et al., 2003; Nappi, Drummond, Thorp, &

McQuaid, 2010). However, relatively little research has focused on bad dreams and nightmares in older adults.

The prevalence of nightmares among older adults has been shown to be just above 4% (Salvio, Wood, Schwartz, & Eichling, 1992), which is significantly lower than the rate for college students (Salvio et al., 1992). However, there are older adults who suffer from nightmares. Among older adults with clinically significant depressive and anxiety symptoms, 11.4% and 17.1%, respectively, report having nightmares (Mallon, Broman, & Hetta, 2000). Therefore, although the prevalence of nightmares in older adults is low overall, they may be exacerbated in older adults with significant symptoms of anxiety or depression.

One of the most common forms of anxiety among older adults is generalized anxiety disorder (GAD), a condition characterized by excessive worry and associated symptoms that can include sleep disturbance. GAD occurs in up to 7% (Beekman et al., 1998) of older adults in community samples and in 11.2% (Tolin, Robison, Gaztambide, & Blank, 2005) of primary care patients. Sleep difficulties are common among older patients with GAD (Brenes et al., 2009; Byers, Yaffe, Covinsky, Friedman, & Bruce, 2010; Kessler et al., 2005). Further, treatment of GAD using a telephone-administered cognitive behavioral therapy (CBT) intervention was shown to have a large effect size reduction on insomnia symptoms (Brenes et al., 2012). However, no attention has yet been given to the prevalence of bad dreams and nightmares in this group. Further, it is unknown whether treating anxiety would reduce bad dream and nightmare frequency. If so, anxiety treatments may be indicated for treating nightmares in older adults with anxiety.

This study aimed to examine the prevalence and correlates of bad dreams in older individuals with GAD relative to a control sample using data from an randomized clinical trial (RCT) investigating the effect of CBT in older adults with GAD. In the larger study, CBT reduced worry severity and depressive symptoms and improved general mental health relative to enhanced usual care (EUC; Stanley et al., 2009). Utilizing data from this study, a recent follow-up study examined the effect of CBT on general sleep difficulties, finding that the group that received CBT had greater reductions in global Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) scores than the EUC group, with the reduction persisting over a 12-month follow-up period (Bush et al., 2012).

Our first aim was to investigate the prevalence of bad dreams in late-life GAD. Our hypothesis was that older adults with GAD would report higher bad dream frequency than older adults without GAD at baseline. The second aim of the study was to examine the associations among bad dream frequency, severity of worry and depression, and quality of life. We expected that bad dream frequency would be positively associated with anxiety symptoms and depressive symptoms and negatively associated with health quality of life at baseline. Our final aim was to examine whether treating GAD using CBT for anxiety would result in a reduction of bad dream frequency relative to EUC. We hypothesized that patients receiving CBT would have a significantly greater reduction from baseline to post treatment in frequency of bad dreams than those receiving EUC.

METHOD

The original study was approved by the institutional review boards of The University of Texas Health Science Center at Houston and Baylor College of Medicine.

Participants

The participants were 227 adults (134 with GAD and 93 without GAD) aged 60 or older ($M = 67.40$, $SD = 6.15$), who were recruited from two primary care clinics for a randomized clinical trial of CBT for late-life GAD (Stanley et al., 2009). Most participants were women (76%) and non-Hispanic (87%). Racially, the sample was 72% Caucasian, 24% African American, 2% Asian, 1% Pacific Islander, and 1% multicultural (see Table 1).

Participants were included in the treatment portion of the study if they had a principal or co-principal diagnosis of GAD, according to the *DSM-IV-TR* (APA, 2000). Individuals who had scores below 24 on the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975), were actively abusing substances, or had psychosis or bipolar disorder were excluded from the study. A total of 968 individuals were referred for the study (75% self-referred), and informed consent was completed by 381 individuals. Of those who completed informed consent, 68 dropped out or were excluded prior to the diagnostic session, 35 were excluded due to the exclusion criteria, 26 failed to complete the baseline measures, and 11 were included as non-study clinical training cases. Thus, 241 individuals met the study's inclusion criteria and were included in the original study. However, 14 dropped out prior to randomization, leaving 227 participants.

TABLE 1
Descriptive and Baseline Statistics

Variable	All Participants With GAD ($N = 134$)	CBT Group With GAD ($N = 70$)	Non-CBT Group With GAD ($N = 64$)	Comparison Group Without GAD ($N = 93$) ^a
Age	66.90 (5.79)	66.60 (5.93)	67.30 (5.66)	68.20 (6.53)
Education years	15.90 (3.01)	16.10 (2.93)	15.70 (3.10)	15.50 (2.80)
Women	105 (78.4%)	56 (80.0%)	49 (76.6%)	63 (67.7%)
Race/ethnicity	—	—	—	—
Non-Hispanic White	103 (76.9%)	53 (75.7%)	50 (78.1%)	65 (70.7%)
African American	25 (18.7%)	12 (17.1%)	13 (20.3%)	24 (26.1%)
Hispanic ^a	11 (8.4%)	5 (7.4%)	6 (9.5%)	6 (6.9%)
Asian	3 (2.2%)	3 (4.3%)	0	1 (1.1%)
Mixed	1 (0.8%)	1 (1.4%)	1 (1.6%)	1 (1.1%)
Other	—	1 (1.4%)	—	1 (1.1%)
Bad Dreams	0.72 (0.97)	0.77 (1.00)	0.67 (0.94)	0.35 (0.67)
PSQI	8.74 (4.05)	8.90 (4.14)	8.62 (3.97)	7.75 (3.93)
BDI-II	16.40 (8.72)	16.30 (8.00)	16.40 (11.50)	13.20 (8.63)
BAI	13.40 (8.74)	12.84 (7.41)	14.00 (10.00)	9.26 (6.60)
PSWQ	55.30 (10.90)	53.30 (10.60)	57.60 (10.90)	46.30 (12.20)
QOLI	2.05 (1.76)	1.99 (1.64)	2.13 (1.88)	2.39 (1.72)
MCS	42.00 (9.58)	42.30 (9.88)	41.60 (9.30)	45.90 (10.80)

Note. The following variables are means (standard deviations): Age, Education, Bad Dreams, PSQI, BDI-II, BAI, PSWQ, QOLI, MCS. The following variables are frequencies (percentage of sample): women, non-Hispanic white, African American, Hispanic, Asian, mixed, other. PSQI = Pittsburgh Sleep Quality Index; BDI-II = Beck Depression Inventory-Second Edition; BAI = Beck Anxiety Inventory; PSWQ = Penn State Worry Questionnaire; QOLI = Quality of Life Inventory; MCS = mental health composite score of the Short Form Health Inventory.

^aTotal N s slightly differ for the race/ethnicity data for the comparison group and for Hispanics, as a few participants chose not to answer those questions. The differing N s are accounted for by the percentages provided.

Measures

Bad dreams. Bad dream frequency was measured by the item, “During the past month, how often have you had trouble sleeping because you have bad dreams?” from the PSQI (Buysse et al., 1989). Participants could rate the frequency of their bad dreams as 0 (*not during the past month*), 1 (*less than once a week*), 2 (*once or twice a week*), or 3 (*three or more times a week*) (Buysse et al., 1989). This measure of bad dreams was slightly positively skewed (skew = 1.09, kurtosis = $-.03$).

Worry. Worry was measured using the Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990), a 16-item scale that assesses tendency to worry and perceived control over worry. The Penn State Worry Questionnaire has adequate internal consistency in samples of older adults (J. G. Beck, Stanley, & Zebb, 1995). Cronbach’s alpha was .88 in the sample.

Anxiety. Anxiety was measured using the Beck Anxiety Inventory (A. T. Beck & Steer, 1993), a 21-item scale that has previously been used to assess anxiety in older adults (Wetherell et al., 2004). Cronbach’s alpha was .87 in the sample.

Depression. The Beck Depression Inventory-II (A. T. Beck & Steer, 1987) was used to assess symptoms of depression. This is a widely used measure of depressive symptoms consisting of 21 items with good psychometric properties in older adults (Gallagher, Nies, & Thompson, 1982). A recent examination of the Beck Depression Inventory-II found it to be a reliable and valid measure of depressive symptoms among older adults (Segal, Coolidge, Cahill, & O’Riley, 2008), and it has been used in studies of older adults with anxiety (Wetherell et al., 2009). Cronbach’s alpha was .87 in the sample.

Quality of life. Quality of life was measured using the Quality of Life Inventory (Frisch, 1994). This scale has shown adequate psychometric properties (Frisch, Cornell, Villanueva, & Retzlaff, 1992), and has been used with older adults (Stanley et al., 2003). Cronbach’s alpha was .89 in the sample.

General mental health. General mental health was measured using the Mental Health Composite, derived from the Short Form Health Inventory (Ware, Kosinski, & Keller, 1996). This is a widely used, standardized measure that has previously been used with older adults (Rozario, Morrow-Howell, & Proctor, 2006).

Procedure

Participants were identified through physician and self-referrals, brochures, and letters describing the study sent to random samples of clinic patients aged 60 or older. Recruitment primarily occurred through physician referral and participant self-referral. Referred participants were asked two anxiety screening questions, and those who responded affirmatively were scheduled for an in-person meeting where informed consent was obtained. Participants then

answered demographic questions and completed the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975) and the Structured Diagnostic Interview for the *DSM-IV-TR* (First, Spitzer, Gibbon, & Williams, 1997). All interviews were audiotaped, and 20% were rated by a second clinician to ensure diagnostic reliability. Adequate diagnostic reliability was found for GAD ($K = 0.64$), social phobia ($K = 0.81$), specific phobia ($K = 0.64$), and depression and dysthymia ($K = 0.75$). A principal or co-principal diagnosis of GAD, confirmed by the Structured Diagnostic Interview for the *DSM-IV-TR*, was required for inclusion in the treatment portion of the study. Participants who did not meet criteria for GAD on the Structured Diagnostic Interview for the *Diagnostic and Statistical Manual of Mental Disorders* (SCID; First et al., 1997) were included in our non-GAD sample. These individuals did not receive treatment. Participants scoring below 24 on the Mini-Mental State Examination, or with active substance abuse, psychosis, or bipolar disorder, were excluded. Participants without a diagnosis of GAD were included as a comparison group. (See Stanley et al., 2009 for more details about the recruitment procedure.)

Baseline assessments were completed prior to randomization, and then participants were randomized into either CBT or EUC. Participants in CBT received up to 10 individual therapy sessions over 12 weeks. On average, CBT participants received 7.40 ($SD = 1.91$) therapy sessions. Treatment consisted of education and increasing awareness of anxiety, relaxation training, cognitive therapy, exposure therapy, problem solving, and sleep hygiene (Stanley, Diefenbach, & Hopko, 2004). Ratings of treatment adherence and therapist competence were adequate (for more details, see Stanley et al., 2009). Following treatment, telephone booster sessions were offered at 4, 7, 10, and 13 months post treatment. Participants in EUC received biweekly phone calls to provide support and ensure participant safety, in addition to any treatment provided by the participants' physician. On average, participants in EUC received 4.30 ($SD = 1.26$) phone calls.

Participants in both groups were followed for 12 months post treatment. Independent evaluators blinded to study condition collected the outcome data by phone. Assessments took place at 3 (post treatment), 6, 9, 12, and 15 months post baseline. All assessment interviews were conducted over the phone and were audiotaped, and 10% were recoded by a second clinician to ensure reliability.

Data Analysis

Aim 1: Bad dream frequency. Bad dream frequency at baseline assessment was compared between participants with principal or co-principal GAD ($N = 134$) and participants without GAD ($N = 93$). Due to potential non-normality within the bad dream item, robust regression was used to examine the association between GAD and bad dream frequency, controlling for depression diagnoses. This procedure uses the M-estimator, rather than the sum of squared residuals, to estimate the regression line to reduce the effect of outliers (Wilcox, 2003). Parametric tests revealed similar results and, therefore, were not included.

Aim 2: Correlates of bad dream frequency. The association between bad dream frequency and anxiety symptoms was calculated from all participants' (both those with and without GAD) baseline assessments. Due to potential non-normality in the bad dream item, Spearman's rank correlation coefficient was used to assess the associations among nightmare frequency and

TABLE 2
Participants Reporting Any Bad Dreams at All Time Points

Variable	Pretreatment	Post Treatment	3-Month Follow Up	6-Month Follow Up	9-Month Follow Up	12-Month Follow Up
CBT	32 (45.7%)	18 (27.7%)	15 (28.3%)	14 (25.9%)	16 (31.4%)	10 (19.2%)
EUC	26 (40.6%)	21 (42.0%)	15 (35.7%)	17 (40.5%)	19 (46.3%)	17 (40.5%)

Note. Participants were identified as having bad dreams if they scored ≥ 1 on the bad dream question of the Pittsburgh Sleep Quality Index. CBT = cognitive behavioral therapy; EUC = enhanced usual care.

anxiety, depression, and general mental health. Parametric tests revealed similar results and, therefore, were not included.

Aim 3: Effects of CBT for anxiety on bad dream frequency. A linear-growth model was used to determine the effects of CBT for anxiety on bad dream frequency. Participants randomized to CBT were compared with participants randomized to EUC across six time points, measured in 3-month intervals across 15 months (for bad dream frequencies and proportions, see Table 2). After we centered time at the baseline assessment, we used the main effect of treatment condition to determine differences in bad dream frequency between CBT and EUC groups at baseline. The presence of depression was controlled in the model. The interaction between condition and time determines whether participating in CBT sessions led to fewer reported bad dreams than EUC over time. We did not include a correction for non-normality, as the random intercept controls for individual differences in bad dream frequency. Separate analyses on mean differences between participants in CBT and EUC were also conducted, controlling for baseline levels of bad dreams at each time point.

RESULTS

We conducted preliminary analyses examining the relation among bad dreams, age, and gender as correlates of bad dream frequency given that, in prior research, nightmares have been shown to differ by age and gender (Nielsen, Stenstrom, & Levin, 2006; Schredl & Reinhard, 2011). Within this sample, frequency of bad dreams did not relate to either gender or age (all $ps > .20$), so gender and age were not controlled in any of the analyses.

Bad Dream Frequency

The presence of GAD was significantly associated with bad dream frequency, $\chi^2(1, N = 227) = 8.09, p = .005$, after controlling for the effects of depression diagnoses. Bad dream frequency was higher among participants with GAD ($M = 0.72, SD = 0.97$) than among those without GAD ($M = 0.35, SD = 0.67$). It should be noted that the mean for bad dreams refers to the score on the PSQI bad dream item, not average bad dreams per week. Of participants with GAD, 21.6% experienced at least weekly bad dreams at baseline. Of participants without GAD, 6.4% experienced weekly bad dreams.

TABLE 3
Means and Standard Deviations of the Bad Dream Item at All Time Points

Variable	Pretreatment	Post Treatment	3-Month Follow Up	6-Month Follow Up	9-Month Follow Up	12-Month Follow Up
CBT	0.77 (1.00)	0.67 (0.94)	0.42 (0.77)	0.39 (0.76)	0.35 (0.56)	0.27 (0.63)
EUC	0.67 (0.94)	0.66 (0.92)	0.60 (0.91)	0.69 (0.98)	0.76 (0.94)	0.62 (0.88)

Note. Mean bad dreams is in reference to the bad dream item score on the Pittsburgh Sleep Quality Index, not average bad dreams per week. CBT = cognitive behavioral therapy; EUC = enhanced usual care.

Correlates of Bad Dream Frequency

Overall, more frequent bad dreams were associated with lower general mental health, $\rho(226) = -.15$, $p = .03$; greater worry, $\rho(227) = .25$, $p < .001$; higher levels of anxiety, $\rho(227) = .27$, $p = .002$; higher levels of depression, $\rho(227) = .13$, $p = .049$; and lower overall quality of life, $\rho(221) = -.21$, $p = .001$, than less frequent bad dreams.

Effects of CBT for Anxiety on Bad Dream Frequency

At baseline, there were no significant differences among CBT and EUC groups in demographic variables, presence of a coexistent diagnosis, number of medical diagnoses, use of psychotropic medications, or bad dream frequency. Nevertheless, we controlled for the presence of depression in the multilevel model. Participants in the EUC group were significantly more likely to drop out during active treatment (5.9% vs. 21.9%, $p = .006$), which appears to have been because of dissatisfaction with the results of random assignment (CBT $N = 0$, EUC $N = 9$). Attrition during the long-term follow-up phase was comparable between the two groups (CBT = 12.9%, EUC = 9.4%, $p = .52$). Analyses revealed no significant differences between completers and non-completers on the demographic variables (for more details, see Stanley et al., 2009).

Participants in CBT did not differ from participants in EUC in bad dream frequency at baseline, $t(132) = 0.59$, $p = .55$. The interaction between condition and time was significant such that participants in CBT experienced a significantly greater reduction in bad dream frequency across the assessment period than EUC participants ($b = -.07$, $p = .04$). Controlling for baseline bad dream frequency, CBT participants had significantly fewer bad dreams than EUC participants immediately following treatment, $t(112) = 2.19$, $p = .03$. Significant differences in bad dream frequency were also found at the 9- and 12-month follow-up assessments, respectively: $t(89) = 2.79$, $p = .006$ and $F(1, 93) = 4.38$, $p = .039$ (see Table 3).

DISCUSSION

Among younger and middle-aged adults, nightmares are associated with several negative outcomes, such as potentially predisposing individuals to develop PTSD (Ohayon & Shapiro, 2000) and future suicide attempts (Sjöström et al., 2009), as well as the presence of lower

levels of well-being (Zadra & Donderi, 2000) and cognitive difficulties (Simor et al., 2012). In addition, nightmares are related to symptoms of many types of psychopathology (Agargun et al., 2003; Claridge et al., 1998; Hartmann, 1981; Hartmann et al., 1987; Haynes & Mooney, 1975; Hersen, 1971; Levin & Fireman, 2002; Nadorff et al., 2011; Nielsen et al., 2000; Semiz et al., 2008; Zadra & Donderi, 2000).

This study found a high rate of bad dreams in older adults with GAD (21.6%). Further, older adults with GAD had significantly more bad dreams than older adults without GAD after controlling for the effects of depression. This is especially notable given that the comparison group likely created a conservative bias given that it consisted of participants who were referred for anxiety treatment and, thus, were likely to be more anxious than the average older adult. The finding that those with GAD had significantly more bad dreams is consistent with prior data (Mallon et al., 2000) suggesting that elders with clinically significant anxiety symptoms reported more nightmares than individuals below the cutoff. Thus, our findings suggest that older adults with anxiety are at greater risk of having bad dreams than those without anxiety. Further, in this study, bad dream frequency was associated with greater symptoms of depression, anxiety, and worry, as well as poorer quality of life, when compared with older adults without bad dreams. Thus, bad dream and nightmare frequency are clinically relevant for older adults.

To date, there has been no published research on nightmare or bad dream treatments for older adults. This study, however, suggests that CBT for anxiety, which included sleep hygiene, reduced bad dream frequency in older adults with GAD. The sleep hygiene session consisted of discussing with the participant the relation between anxiety and sleep, as well as sleep hygiene skills (e.g., having a consistent wake time, having time to relax before bed, and limiting caffeine). No dreams, including bad dreams or nightmares, were discussed during the sleep hygiene session.

Although causal relations have not been established, it is possible that the reduction of bad dreams may have been due to a reduction in anxiety symptoms, as anxiety was the primary focus of the intervention. In addition, all participants received a session of sleep hygiene, which could have led to more consolidated sleep and, hence, fewer opportunities to awaken and remember negative dreams. Regardless of the explanation, this study is an important first step because it provides a treatment option for a population at high risk for nightmares and bad dreams. Our findings also lay the groundwork for studies using anxiety treatments to reduce nightmares and bad dreams in younger samples.

Data from this study suggest that practitioners should consider assessing for nightmares and bad dreams in older adults with GAD. Nightmares or bad dreams also may serve as a marker for GAD, suggesting that providers should evaluate worry and anxiety if an older adult reports having either of these symptoms. Further, our findings also suggest that treatment targeting anxiety may be associated with a reduction of disturbing dreams. Thus, anxiety may also represent a potential treatment target for reducing bad dreams and nightmares.

Limitations

This study is limited by its use of a single-item measure of bad dream frequency. The measure did not specifically mention nightmares, and it assessed bad dream frequency using ranges instead of actual numbers of bad dreams. Thus, this study is unable to differentiate between

nightmare frequency and bad dream frequency, and did not assess severity or distress caused by either bad dreams or nightmares. The one item also only assessed nightmares over the last month, preventing an examination of nightmare chronicity. Further, our measure of bad dreams is retrospective, which may lead to an underestimate of nightmare frequency (Robert & Zadra, 2008). Despite these limitations, this study is one of the first to examine bad dream frequency in anxious older adults, and demonstrates that bad dream frequency is clinically relevant and treatable in this sample.

The study is also limited by the fact that the sample is not representative of older-adult patients in primary care in age, gender, and education. Further, within the sample, randomized patients were more likely to be younger and female than non-randomized patients. This may be because the recruitment site primarily caters to insured patients, and most of the patients were self-referred to the study. Thus, these results may not generalize to all primary care settings.

Third, this study was limited by the absence of a detailed clinical sleep assessment, which precluded determining whether bad dreams were associated with functional impairments, sleep impairments, or both (obstructive sleep apnea, periodic limb movement disorder, etc.). These disorders often lead to awakenings and could potentially result in an increase in nightmares or bad dreams. However, this limitation was mitigated by our use of random assignment, which helps ensure that the groups are equivalent on unmeasured variables, such as underlying sleep disorders.

Finally, we were unable to determine directionality between bad dreams and GAD, as our baseline data were cross-sectional. The literature would benefit from future research that examines these variables longitudinally and, thus, can assess the directionality of the relation between GAD and bad dreams.

CONCLUSIONS AND FUTURE DIRECTIONS

Older adults with GAD had significantly higher frequencies of bad dreams than older adults without GAD, and CBT for anxiety led to a significant reduction in bad dream frequencies. Thus, interventions to reduce anxiety are a potentially useful approach for treating disturbing dreams and nightmares in older adults with both anxiety and disturbing dreams. More research is needed to investigate whether other anxiety treatments, such as selective serotonin receptor inhibitor medications, also lead to a reduction in dreams and nightmares in older adults with GAD. Further, the literature would benefit from research examining whether treatment, such as CBT, also improves bad dream and nightmare severity.

Research examining the association between anxiety and bad dreams and nightmares in younger samples is warranted. In particular, research investigating the potential utility of anxiety treatments to reduce bad dreams and nightmares in younger adults with anxiety would be especially interesting.

This study is one of the first to document that older adults with anxiety are at a greater risk of bad dreams than older adults with no anxiety, and is the first to examine the efficacy of a treatment for older adult bad dreams. Our findings demonstrate that CBT for anxiety significantly reduces bad dreams in older adults with GAD, when compared with a control treatment. This study supports the use of CBT for anxiety in individuals with anxiety and bad dreams or nightmares because it shows it to be efficacious for both anxiety and bad dreams.

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