

Fibromyalgia Symptoms and Sleep Patterns

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Abstract

Background
 Almost all fibromyalgia (FM) patients suffer from fatigue, and most also have sleep disturbances, which have been suggested as a possible cause for the fatigue. Insomnia, the sleep disturbance most often reported by FM patients, has been hypothesized to result in some cases from attempts to extend one's sleep beyond physiological needs.

Objective
 To look for a possible link between the sleep habits and attitudes towards sleep of FM sufferers and their symptoms of fatigue, pain, and depression.

Method
 A questionnaire study was carried out with the members of a self-help organization for FM sufferers. The questionnaire was given to all 156 members who came to an evening meeting; participants were asked to return the filled-in questionnaire on leaving. Respondents answered questions about their sleep habits, insomnia, attitudes about sleep, fatigue, pain, and demographics.

Results
 Usable questionnaires were returned by 62 individuals; 60 (93%) were women. Mean age was 48.4 years. Fifty-two (84%) reported having received a medical diagnosis of FM; 13 (21%) chronic fatigue syndrome, and 19 (31%) depression. Eighteen (29%) used sleep medication daily. Respondents spent on average 8.7 hours in bed, and got up at 7:36 am. For the entire sample, insomnia scores and pain scores were significantly correlated with fatigue scores, as was a single-item visual analog scale for self-rated depression. Pain and insomnia were also correlated. Respondents' scores on the sleep attitudes questionnaire, where higher scores indicated increased importance attached to having a good sleep, also correlated significantly with pain and fatigue ratings. Depression correlated with time in bed on weekdays.

For the 52 respondents who reported having been diagnosed with FM, fatigue was significantly correlated with time in bed (including naps), as was insomnia. Daily users of sleep medication were significantly more likely to have FM than those who didn't use sleep medication, and spent significantly more time in bed than non-users (9.6 hours vs 8.5 hours). Their self-rated depression scores were significantly correlated with rising time and with time in bed after 6 am. For the 41 respondents (66%) who take naps, time in bed correlated significantly with fatigue and with insomnia.

Conclusions
 This questionnaire study supports a link between sleep patterns and FM symptoms: more time in bed and later rising times are associated with increasing severity of fatigue, pain, and insomnia. Moreover, the more importance that is attached to getting sufficient amounts of quality sleep, including sleeping late or missing work or school, the greater the pain and fatigue experienced.

The author discusses the possible role of long sleep and late rising in bringing about both insomnia as well as excessive Rapid Eye Movement (REM) sleep. As excessive REM sleep is hypothesized to cause depression, it is possible that it may also bring about some FM symptoms. This suggests that sleep restriction and early rising may be helpful in treating fibromyalgia.

Introduction

More than 98% of fibromyalgia (FM) patients suffer from fatigue¹, which is of clinically important severity in 76%. Sleep disturbance is also very common² (> 75%) and is thought by some to be causally related to FM symptoms³. In FM and in other conditions where sleep disturbance and fatigue coexist, such as Chronic Fatigue Syndrome (CFS), Irritable Bowel Syndrome (IBS), and Temporomandibular Disorder⁴, patients typically complain of unrefreshing sleep⁵ and on polysomnography may have alpha intrusions into delta sleep, a phenomenon associated with sleep disturbance⁶ and with fatigue and malaise⁷. However, the alpha-sleep pattern occurs even in the absence of symptoms and may simply represent a higher level of arousability during sleep⁸.

Why would a person be highly arousable during sleep? One hypothesis has to do with sleep surfeit, ie when the individual attempts to sleep longer than required by their physiological sleep need. Sleeping longer has been shown to induce insomnia⁹ and interventions which reduce time in bed (sleep restriction or sleep

restriction) are effective in treating insomnia¹⁰. Reducing morning sleep in FM patients, for example by the administration of gamma-hydroxybutyrate¹¹, may be particularly useful not only in decreasing the alpha anomaly but also fatigue and pain.

In patients with depression, fatigue plays a prominent role. Sleep manipulations such as late partial sleep deprivation (but not early partial sleep deprivation) are effective treatments¹², suggesting that morning sleep may play an important role in initiating or maintaining depression. Psychostimulants, which reduce sleep¹³, have been found useful in treating the apathy and lack of energy found in victims of stroke and other chronic conditions¹⁴.

The above interventions seem to have in common a suppression of Rapid Eye Movement (REM) sleep. It has been proposed that too much REM sleep may cause fatigue¹⁵ and even depression in predisposed individuals. Thus, sleeping too long, perhaps aided by the use of hypnotic medication, or sleeping late in the morning when REM sleep propensity is at its highest¹⁶, might be expected to play a role in the fatigue found in FM and related conditions. The concurrent insomnia would also be caused by trying to sleep longer than required, in this paradigm.

Attitudes and beliefs about sleep are thought to play an important role in perpetuating insomnia¹⁷; for example, a person who believes that a poor night's sleep will severely impact daytime functioning may be more likely to stay in bed longer in an attempt to get additional sleep.

The objective of this study is to explore the relationships between sleep habits and attitudes, and the symptoms of fibromyalgia.

Method

All 156 attendees at a monthly evening meeting of the self-help support group "Fibrohope" for FM sufferers and their families, were asked to fill in a questionnaire and return it at the end of the meeting. The questionnaire used has been described elsewhere (Olders H. Cancer Fatigue and Sleep: A Possible Role for Rising Time? Poster presented at Canadian Sleep Society Annual Meeting, Ottawa, 2001 May 12). The Beck Depression Inventory and the Mood Scale were not used in this study, and the following items were changed:

- **Sleep and Insomnia Questionnaire**: Sleep habits on workdays and nonwork days were asked separately, and information about hypnotic medication usage was also solicited.

- **Fatigue Scale**: For chronic fatigue, impact on daily life, work or school, and social activities were rated.

- **Pain**: Added to the questionnaire; consists of five VAS which ask about current pain, worst and least levels of pain over the previous 2 days, acceptable pain level, and impact of pain on work or school. This questionnaire was adapted from the one used by the Chronic Pain Management Centre at the SMBD-Jewish General Hospital.

- **Demographics**: Whether diagnosed by a physician as having fibromyalgia, chronic fatigue syndrome, or depression.

Results were analyzed using Data Desk software (version 6.1.1; Data Description, Inc.) on a Macintosh computer.

Results

Out of 156 questionnaires distributed, 62 (39.7%) useable responses were returned. Sixty (96.8%) of the 62 were women; mean age of all respondents was 48.4 years (range 19-80). The great majority, 52 (83.9%) reported having received a diagnosis of FM from a physician; 13 (21.0%) with CFS, and 19 (30.6%) with depression. Only 16 (25.8%) reported taking daytime naps. Daily users of sleep medication represented 18 (29.0%) of the sample, while 21 (33.9%) were non-users.

Table 1 presents sleep parameters for the entire sample, and for individual diagnoses. Only weekday times are included. Time in bed excludes daytime naps but time in bed after 6 am includes naps. Two-sample t-tests were employed.

Table 1. Sleep parameters by diagnosis

	N	Not diagnosed	Received diagnosis	Entire sample
Fibromyalgia:	8	52	62	
Time in bed	8.47 hrs	8.74	8.66	
Rising time	7:26 am	7:39 am	7:36 am	
Time in bed after 6 am	1.70 hrs	1.95	1.92	
Time in bed + nap times	8.86 hrs	9.37	9.23	
Chronic Fatigue Syndrome:	20	13		
Time in bed	8.30 hrs	8.73		
Rising time	7:08 am	7:41 am		
Time in bed after 6 am	1.33 hrs	2.17		
Time in bed + nap times	8.64 hrs	9.62		
Depression:	26	19		
Time in bed	8.23 hrs	9.38		
Rising time	7:10 am	8:46 am	P=.0091	
Time in bed after 6 am	1.34 hrs	3.13	P=.0052	
Time in bed + nap times	8.45	10.15		

Correlations between variables are shown in table 2 for the entire sample, and in table 3 for the 52 respondents who reported having a FM diagnosis.

Table 2. Correlations for entire sample

	Chronic fatigue	Insomnia score	Sleep attitudes	Depression
Insomnia score	.288 P = 0.0282	1		
Sleep attitudes	.430 P = 0.0021	.021	1	
Depression	.424 P = 0.0010	.144	.229	1
Pain score	.705 P < 0.0001	.301 P = 0.0243	.305 P = 0.0331	.122
Time in bed	.296 P = 0.0369	.263 P = .0573 ns	.224	.282 P = 0.0429
Rise time	.096	.107	.177	.235
Time in bed after 6	.172	.121	.260	.232
Time in bed + nap times	.492 P = 0.0172	.257	.466 P = 0.0385	.290

Table 3. Correlations for 52 respondents with fibromyalgia

	Chronic fatigue	Insomnia score	Sleep attitudes	Depression
Insomnia score	.128	1		
Sleep attitudes	.418 P = .0053	.004	1	
Depression	.415 P = .0030	.090	.199	1
Pain score	.549 P < .0001	.074	.312 P = .0441	-.039
Time in bed	.445 P = .0032	.245	.284 P = .0531 ns	.325 P = 0.0333
Rise time	.218	.090	.235 P = .0881 ns	.257
Time in bed after 6	.270 P = .0760 ns	.117	.314 P = .0548 ns	.268 P = .0756 ns
Time in bed + nap times	.623 P = .0044	.239	.511 P = 0.0303	.356

For individuals reporting diagnoses of CFS and/or depression, chronic fatigue correlated significantly with sleep attitudes and with pain score. For nappers, time in bed correlated significantly with chronic fatigue and with insomnia score.

Respondents who were not working had insomnia which correlated significantly with time in bed.

Daily users of sleep medication, compared to non-users, were more likely to have FM (chi-square = 4.024, P = 0.0449). Table 4 gives correlations for the 18 respondents using sleep medication on a daily basis. These respondents also differed significantly (2-sample t-tests) from non-users in their insomnia and pain scores, as well as time in bed (table 5).

Table 4. Correlations for 18 respondents using sleep meds daily

	Chronic fatigue	Insomnia score	Sleep attitudes	Depression
Insomnia score	.310	1		
Sleep attitudes	.237	.171	1	
Depression	.126	.087	-.045	1
Pain score	.486	-.011	.538 P = .0472	-.422 P = .0917 ns
Time in bed	.381	.694 P = .0041	-.022	.488 P = .0651 ns
Rise time	.035	.426 P = .0879 ns	.198	.490 P = .0457
Time in bed after 6	.127	.553 P = .0213	.305	.492 P = .0451
Time in bed + nap times	.709 P = .0323	.716 P = .0300	.286	.266

Table 5. Daily users vs Non-users of Sleep Medication

	Non-users	Daily users	P
N	21	19	
Insomnia score	0.31	0.57	0.0024
Pain score	0.53	0.68	0.0492
Time in bed*	8.5 hrs	9.6	0.0362
Time in bed + nap times*	9.0 hrs	10.4	0.0425

* Weighted average for weekdays & weekends

Respondents who work full time (ie, 5 or more days per week) were significantly less likely to have been diagnosed with CFS (chi-square = 6.801, P = 0.0091) or with depression (chi-square = 7.481, P = 0.0062) than those who work part time or do not work (4 or fewer days per week).

Discussion

Given that the recommended sleep duration for adults is 8 hours, and many adults are believed to sleep considerably less, the time in bed for this sample of 9.23 hours including naps, seems excessive, and particularly so for those diagnosed with depression, at 10.15 hours. For individuals diagnosed with FM, CFS, or depression, there was a trend to spending more time in bed than respondents not so diagnosed. Those with depression diagnoses also got up later. Sleep attitudes appeared to have some influence on sleep habits, for FM sufferers: individuals who agreed more strongly with statements such as "If I don't get enough sleep during the night, I should make up for it by sleeping late or by taking a long nap", were more likely to spend more time in bed and nap more. It appears that the resulting longer times in bed translated into higher levels of chronic fatigue and of depression for these individuals.

These findings support the hypothesis that a circadian variable, such as REM sleep, may be involved in the pathology of these conditions. This study failed to demonstrate the hypothesized relationship between insomnia and longer times in bed, except for the subgroup of respondents using sleep medication on a daily basis. This subgroup also had increasing levels of depression with later rising times, partially replicating the findings of an earlier study with cancer patients (Olders H. Cancer Fatigue and Sleep: A Possible Role for Rising Time? Poster presented at Canadian Sleep Society Annual Meeting, Ottawa, 2001 May 12).

Weaknesses of the study

There was no comparison group. There were many missing responses. Overall response rate was low. Sample size was small. One-time questionnaires are less reliable than sleep diaries in eliciting sleep habits.

Directions for future research

The hypothesis that excessive REM sleep may be associated with FM symptoms such as fatigue and depression, could be more adequately demonstrated with ambulatory polysomnography. A cause and effect relationship could be demonstrated by a protocol employing sleep restriction and early rising as treatments for the fatigue, insomnia, and depression of fibromyalgia.