

# Insomnia and Depression: Which Comes First?

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It has been well documented that depression can lead to insomnia. However, evidence from previous research and from clinical experience indicates that the reverse can also be the case: long-standing insomnia can often lead to depression. The aim of this study is to test the hypothesis that, for many people suffering from both depression and insomnia, treating the insomnia successfully without medication can lead the depression to lift as well. The sample consisted of 86 consecutive patients or clients who presented as suffering from chronic insomnia. Two thirds of these people were also suffering from depression at intake. During an initial hour-long interview, self-report estimates of key sleep parameters were recorded, and the Beck Depression Inventory was administered. Subjects were then introduced to the "Sleep Better Without Drugs" self-help program (a book and three audio cassettes), which they used at home to improve their sleep. At follow-up, six to eight weeks later, the sleep parameters were recorded again and the Beck Depression Inventory was re-administered. Results showed that 70% of the insomnia sufferers who were depressed before treatment and learned to sleep better were no longer depressed, or were significantly less depressed, once their sleep had improved. By contrast, among people who did not learn to sleep better, none experienced a significant reduction in depression. The conclusion is that, for many people who suffer from both depression and insomnia, treating the insomnia successfully without medication can eliminate or significantly reduce the depression.

**CURRENT CLAIM:** The key finding of the study is that, for many people who suffer from both depression and insomnia, treating the insomnia successfully without medication can eliminate or significantly reduce the depression.

The objective of this study is to test the hypothesis that, for many people suffering from both depression and insomnia, treating the insomnia successfully without medication can eliminate or alleviate the depression.

It is well known that depression can lead to insomnia. However, research evidence and clinical experience indicate that the reverse can also be the case: long-term chronic insomnia may be associated with reduced quality of life and depression. In a study by the U.S. National Sleep Foundation and the Gallup Organization in 1991 (Roth and Ancoli-Israel, 1999), the daytime consequences and correlates of insomnia were examined in a survey of 1,000 randomly selected Americans. Respondents were classified as having chronic insomnia, occasional insomnia, or no insomnia. There were significant differences between those reporting insomnia and those with no sleep difficulty. Problems reported by insomnia sufferers included impaired concentration, impaired memory, increased irritability, decreased ability to accomplish daily tasks, and decreased enjoyment of family and social relationships. Importantly, most of these variables showed an increasing degree of impairment with greater frequency of sleep disturbance. These findings suggest that insomnia negatively affects aspects of waking function that are related to quality of life.

In a more recent study, Zammit et al. (1999) found that insomnia is associated with significant impairments in quality of life, and that insomnia sufferers are more likely to be depressed than are good sleepers. Similarly, Hatoum et al. (1998) found that, after controlling for demographic variables

and co-morbid conditions, insomnia is significantly associated with reduced health-related quality of life.

In my clinical experience, when insomnia sufferers are asked, "How is your tiredness during the day?" the responses include: "I'm fighting tiredness all the time... It's hard work just to get through the day... I'm absolutely bugged... I fall asleep at my desk at work... I'm so exhausted that life's not worth living... I feel foggy... My eyes are sore and heavy... Absolute total chronic exhaustion... It's hard to concentrate on anything... My memory is terrible... When I get home I just fall asleep on the couch... By the end of the day I can barely function... I've had to cut out a lot of social activities... I'm just bone tired... Shocking... I'm fuzzy in the head... I'm really irritable and my marriage is suffering... Terrible... I had to quit my job because I was so exhausted from lack of sleep." When chronic insomnia leads to such debilitating tiredness during the day, it is not difficult to understand that depression can follow.

In summary, both empirical evidence and clinical experience indicate that chronic insomnia tends to be associated with deterioration in the quality of life and with depression. But can relieving the insomnia eliminate or alleviate the depression?

## **SUBJECTS**

The sample consisted of 86 consecutive patients or clients presenting with chronic insomnia to the private practice of the investigator, a clinical and counselling psychologist

specializing in non-drug treatment of insomnia. They were aged from 16 to 88 years (average age=42), the genders were approximately evenly balanced (female=54%), and they had been suffering from insomnia for up to 55 years (average duration=14 years). Sixty percent were taking sleeping medication, mostly benzodiazepines, at the time of the initial interview.

The subjects were referred to the investigator by specialists in sleep disorders medicine, general practitioners, other medical practitioners, psychologists, a variety of other health professionals, government and private rehabilitation agencies, and former users of the "Sleep Better Without Drugs" self-help program. The sample covered a wide range of occupations, both white-collar and blue-collar, as well as people who were unemployed. Education levels ranged from those who left school at age 14 to those with higher degrees.

Two-thirds of the subjects were found at the initial interview to be suffering from depression. Of these, 63% were classed as "mildly" depressed, 24% were "moderately" depressed, and 13% were suffering from "severe" depression. One-third of those who were depressed at the initial interview had been treated with anti-depressants at some time, including 22% who were taking anti-depressants currently and had been stabilized on a particular dose for at least three months.

The sample for statistical analysis was reduced to 84 by excluding two persons who began taking anti-depressant medication after their initial interviews. The initiation of such medication, of course, makes it impossible to establish whether any improvement in depression that might be observed stems from improvement in sleep or from the anti-depressant medication itself.

Three case examples of subjects in the study are presented in the Appendix.

## METHODS

### Procedure

Data were collected by use of personal interview, including the administration of the Beck Depression Inventory (Beck and Steer, 1987), and by subject self-assessment, using the sleep diary from the "Sleep Better Without Drugs" self-help program (Morawetz, 1994).

### Measures and Materials

#### Interviews

To begin with, subjects were interviewed individually by the investigator for one hour. Items covered in this initial interview included how the person was sleeping currently and in the past, when the sleep problem began, what seemed to have caused and maintained the insomnia, and any usage of sleeping medication and anti-depressant medication currently and in the past. Key sleep parameters were recorded from subject self-report, including number of minutes to fall asleep, number of wakings during the night, number of minutes awake during these wakings, number of hours slept, tiredness during the day, and usage of sleeping medication. Possible physiological causes of the sleep problem (sleep apnea, restless legs

syndrome, periodic limb movements in sleep, etc.) were ruled out. In addition, the Beck Depression Inventory was administered to each person and the depression score was recorded.

Next, the investigator wrote down for the person in this first hour the precise diagnosis (type or types of insomnia) and approximately eight to twelve items from the "Sleep Better Without Drugs" self-help program that seemed likely to be important for this particular person given the diagnosis, sleep history, and current sleep pattern. The person then took home the self-help insomnia control program and used it for six weeks. No therapy for depression was provided.

Six to eight weeks later there was a 30 minute follow-up interview with the investigator at which the same key sleep parameters were recorded, the Beck Depression Inventory was administered again, and the changes in both sleep parameters and depression score were noted.

### The Self-help Insomnia Program

The "Sleep Better Without Drugs" self-help program, which the subjects used at home for six weeks to treat their insomnia, consists of a book and three audio cassettes (Morawetz, 1994). It first helps people to diagnose their sleep problem (in this study the diagnosis was done by the investigator in the initial interview) and then presents more than 50 strategies that insomnia sufferers can use to improve their sleep.

The strategies include sleep scheduling and stimulus control techniques ("the nine rules for better sleep"), identifying and using the body's ultradian rhythm ("learning to catch the wave of sleepiness"), cognitive therapy ("20 ways to reduce thinking and worrying in bed"), physical and mental relaxation, methods to eliminate sleeping medication (always gradually and in consultation with the prescribing doctor), a sleep diary, information about sleep and sleep hygiene, advice for shift workers, and 30 important sleep hints. More information about the self-help program is available from [www.sleepbetter.com.au](http://www.sleepbetter.com.au).

### Data Analysis

Subjects' sleep was classified as either "substantially improved" or not. For a person's sleep to be classed as having "substantially improved," he or she must have reported one or more of the following:

- A reduction of at least two hours in the time taken to fall asleep;
- An increase of at least two hours in total sleep time during the night;
- A reduction of at least eight in the number of wakings during the night;
- Elimination of usage of sleeping medication, with no deterioration in key sleep parameters.

## RESULTS

### Insomnia

Using the strict criteria that were outlined above, 87% of all subjects demonstrated substantial improvement in their sleep. There was no significant difference between the rates of improvement achieved by those who were depressed before

treatment (88%) and those who were not depressed before treatment (86%).

Further, in just over half of the cases of substantial improvement in sleep, two or more of the above criteria for substantial improvement were fulfilled. For example, three-quarters of the people who were taking sleeping medication regularly before treatment were no longer taking such medication at follow-up and were sleeping significantly better on at least one other criterion. For example, one woman who had taken benzodiazepines every night for 20 years was no longer taking benzodiazepines, and she was falling asleep two hours faster and sleeping two hours longer, on average, each night. In more than two-thirds of all cases, there was also an improvement in tiredness during the day.

**Depression**

More than half (57%) of the people who were depressed before treatment and learned to sleep better were no longer depressed at follow-up. An additional 13%, while still depressed, had a reduction of at least 40% in their depression score. That is, the key finding of this study is that 70% of the insomnia sufferers who were depressed before treatment and learned to sleep better were no longer depressed, or were significantly less depressed, once their sleep had improved.

By contrast, of the people who were depressed before treatment who did not achieve a significant improvement in their sleep, none (0%) moved from being depressed to being not depressed at follow-up, and none experienced a reduction in depression score of even 33% (Figure 1).

The difference between these two sets of results (as displayed in Figure 1) is significant at the 0.00001 level. That is, it is extremely unlikely that the improvement in depression for those who learned to sleep better happened by chance, or because of the passage of time, or because of the placebo effect of the treatment (those whose sleep and depression did not improve received exactly the same treatment as those whose sleep and depression did improve).

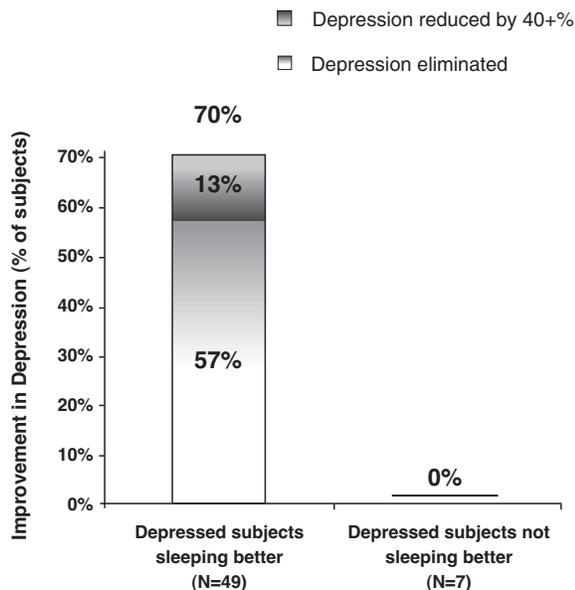


Figure 1. Improvements in depression exhibited by people treated for chronic insomnia.  $p < 0.00001$

**Table 1**  
**Success Rates of “Sleep Better Without Drugs” Self-help Program**

Author	Country (Year)	Success Rate (substantially improved)
Morawetz (1994)	Australia (1990)	80%
Iler (1997)	USA (1997)	83%
Morawetz (2000)	Australia (2000)	87%

**DISCUSSION**

**Insomnia**

With regard to the results on insomnia, the 87% success rate in the present study is consistent with the findings of two earlier studies of the success rates of insomnia sufferers using the “Sleep Better Without Drugs” self-help program (Table 1). An earlier Australian study found that the success rate was 80% (Morawetz, 1994, Appendix A), and an independent U.S. study found that the success rate was 83% (Iler, 1997). The slightly higher success rate in the present study is easily explained. In the U.S. study, there was no therapist involvement at all—the “Sleep Better Without Drugs” self-help program was simply sent to insomnia sufferers in the mail—while in the previous Australian study, a preliminary, less comprehensive version of the self-help program was used.

These success rates are also consistent with, if a little higher than, the success rates achieved by other non-drug treatments for insomnia. A taskforce of experts appointed by the American Academy of Sleep Medicine recently reviewed 48 clinical trials and two meta-analyses. They found that “between 70% and 80% of patients treated with non-pharmacological interventions benefit from treatment” (Morin et al., 1999). They also found that the improvements in key sleep parameters produced by these therapies for chronic insomnia sufferers are “reliable and durable” (ibid.). Many of the studies reviewed by these sleep specialists had only one active treatment (e.g., progressive muscle relaxation), so it is not surprising that “Sleep Better Without Drugs,” which is a comprehensive multi-faceted integrated program, has a somewhat higher success rate.

Finally, a number of studies have found that cognitive behavioral self-help manuals can provide effective treatment for insomnia (Alperson and Biglan, 1979; Morawetz, 1989; Riedel et al., 1995; Mimeault and Morin, 1999).

**Depression**

The results on depression achieved in this study appear to be very robust. They were achieved without significant variation across age groups, genders, and occupations. They were achieved whether the initial sleep problem was sleep-onset insomnia, sleep-maintenance insomnia, early morning waking, or medication-dependence insomnia. They were achieved whether the person was taking anti-depressant medication before treatment or not, and they were achieved regardless of the initial severity of the depression. There was also no significant variation if the two sleep-related items were removed from the Beck Depression Inventory.

In any discussion of depression and insomnia, early morning waking (waking up and not being able to go back to sleep) deserves a special mention. Early morning waking is often seen as a symptom of depression, and it was a problem, initially, for more than half of the sample. In 95% of cases, it was eliminated at follow-up. That is, 95% of the people who suffered from early morning waking on intake learned not to wake during the night, or if they woke, learned to go back to sleep within 30 minutes (normal), instead of staying awake for hours. More than half (58%) of the people who were initially suffering from early morning waking and then learned to sleep better were no longer depressed at follow-up. These results indicate that, for many people suffering from both early morning waking and depression, treating early morning waking successfully without medication can eliminate or significantly alleviate the depression.

Finally, just over half of those subjects who were using anti-depressant medication at the initial interview had ceased using it by follow-up, were sleeping significantly better, and were no longer depressed. This is despite the fact that reducing anti-depressant medication was not mentioned at all by the investigator or the self-help program.

### Conclusion

While it is well established that depression can lead to insomnia, it is also the case that having chronic insomnia can lead a person to become depressed. The present results indicate that, for many people who suffer from both depression and chronic insomnia, treating the insomnia successfully without medication can eliminate or significantly reduce the depression.

### ACKNOWLEDGMENTS

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## APPENDIX

### Three Case Examples\*

#### Samantha, 39, Salesperson

Samantha's sleep problem began 15 years ago with stress at work. At initial interview, she was taking four to seven hours to fall asleep, and she would then sleep for a total of two or three hours. She was treated for depression over the years with Zoloft, Prozac, Serzone, and psychiatry, and she was hospitalized in a psychiatric hospital for a week. She tried a variety of benzodiazepines, including Rohypnol and Normison, but they did not give lasting improvement in her sleep. She also tried hypnotherapy, acupuncture, massage, and herbal remedies. She was off work on WorkCover for some months. At initial interview she scored "moderately depressed" on the Beck Depression Inventory; for example, she marked, "I feel sad," and "I have thoughts of killing myself but I would not carry them out."

At follow-up, six weeks later, Samantha was falling asleep in 30 minutes (normal), she was sleeping seven hours a night, and she was taking no medication at all for sleep or depression. Her score on the Beck Depression Inventory had fallen to "not depressed;" for example, she marked, "I do not feel sad," and "I don't have any thoughts of killing myself." At follow-up, she remarked, "This is the best thing I've ever done. I don't feel depressed any more."

It appears, therefore, that Samantha's depression was a consequence of her insomnia, rather than the cause. Hence, it was necessary to treat the insomnia successfully in order to relieve the depression.

**Robert, 48, Unemployed**

Robert's sleep problem began 12 years ago when he started doing shiftwork. The shiftwork ended nine years ago, but the sleep problem continued as a habit. At initial interview, Robert was taking five or six hours to fall asleep, and was sleeping for three or four hours. Because of his poor sleep, he was unable to hold down a job and was receiving unemployment benefits. He said that he had many jobs to do around the house, but he was too exhausted to make a start. He scored "severely depressed" at intake; for example, he marked, "I feel my future is hopeless."

At follow-up, eight weeks later, Robert was falling asleep in 45 minutes, and he was sleeping six hours a night. His depression score had fallen by 67% so that he now scored only "mildly depressed." For example, he now marked, "I am not discouraged about my future." He stated at follow-up, "Now that I'm sleeping better, I have a lot more energy, so I can do some of the work around the house that I couldn't do before. In the last six weeks I've removed the weatherboards off a wall [13 meters long and 3 meters high], I've removed the paint off them, I've straightened the wall and insulated it, I've put the weatherboards back on again, and I've put on two coats of paint. I just need to put on the last coat of paint and that job will be finished."

It seems that, as with Samantha, Robert's depression was mainly a consequence of the sleep problem rather than a cause. He still had some residual (and understandable) depression because of his difficulty finding a job and because of some medical problems—but two-thirds of his depression was eased once he was sleeping better and had enough energy to do the things he wanted to do.

**Alan, 58, Company Executive**

Alan's sleep problem began 26 years ago when he was experiencing severe financial problems (he was about to lose his house) and he lay awake worrying about them. His financial problems had long since been resolved and his house was saved, but the sleep problem remained.

Alan was diagnosed as being depressed. "I'm not depressed," he protested, "I'm just exhausted," but his protests were ignored. He was prescribed the following anti-depressant medications over a period of 26 years: Tryptanol, Tolvon, Deptran, Petrofin, Prothiaden, Lithium, Marplan, Prozac and Parnate. When these medications did not help, he was hospitalized for several months in a psychiatric hospital. When that did not help, he was given ten electric shock treatments (ECT). "In the hospital we'd sit around watching Rumpole and MASH on television," he said. "The people around me who were depressed were crying, but there were two or three of us who were laughing. We knew we weren't depressed. We were just too tired to function."

When Alan learned to sleep better, which took about six weeks, his "depression" (or "exhaustion" as it seems to have been), disappeared. [This last case example is reprinted from Morawetz (1994). It is included here as an extreme example of what can happen when it is mistakenly assumed that depression is causing insomnia, whereas in fact the insomnia is causing the depression].

\*Names and identifying details in these case examples have been changed to preserve anonymity.