Sleep Problems and Smoking Cessation in Women

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Sleep and Smoking

- Cigarette smoking can negatively impact sleep quality.
- Sleep disturbance, a symptom of nicotine withdrawal, can interfere with smoking cessation.
- Sleep quality and daytime drowsiness may interfere with cessation or longer-term abstinence.
- Nocturnal ‘sleep-disturbing nicotine cravings’ have also been reported during smoking cessation.
Sleep, Smoking and Women

- Women report more sleep disturbances than men
  - More nocturnal disruptions
  - Poorer sleep quality
  - More symptoms of insomnia
- Women also have more difficulty quitting smoking than men
- Little is known about how self-reported sleep changes during a smoking cessation program
Aims

Accordingly, we evaluated the relationship between sleep and cessation outcome among women enrolled in cessation treatment.

Specifically, we sought to:
1. Describe sleep among women in a smoking cessation program
2. Determine whether sleep disturbances at baseline or at 1 month predict smoking status at 3 months
Hypotheses

1. Subjective sleep complaints over the first three months would differ between women who did and did not maintain smoking abstinence
2. Sleep complaints prior to quitting and early in cessation would be associated with smoking at 3 months
Methods

- Women (N = 322) enrolled in a smoking cessation treatment study
- Assessments of smoking, sleep, nicotine withdrawal and depressive symptoms were completed at baseline and prior to each of 12 counseling sessions
- Sleep quality was assessed at baseline, week 4 and 3 month follow-up
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<thead>
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<tbody>
<tr>
<td><strong>Participant Characteristics</strong></td>
<td>(N=322)</td>
</tr>
<tr>
<td>Age</td>
<td>41.9 (10.2)</td>
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<tr>
<td>College Education</td>
<td>34%</td>
</tr>
<tr>
<td>% White</td>
<td>86%</td>
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<tr>
<td>Body Mass Index</td>
<td>27.4 (5.5)</td>
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<tr>
<td>Cigarettes/Day</td>
<td>20.6 (8.2)</td>
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<td>Nicotine Dependence</td>
<td>5.2 (2.1)</td>
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<tr>
<td>BDI*</td>
<td>6.9 (6.4)</td>
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* Sleep question removed
Treatment

- Counseling
  - 12 sessions over a 10-week period
  - TQD is week 3

- Medication
  - Start 1 week prior to quitting
  - Continue medication for 24 weeks
Sleep Measures

- **Sleep Disturbance:**
  - 1 item from the Beck Depression Inventory
  - Dichotomized into “no vs. any” sleep disturbances

- **Drowsiness and Insomnia:**
  - 2 items on visual analogue scale for withdrawal symptoms in the previous 24 hours
  - Scores ranged from 0 (“not at all”) to 100 (“severe”).
  - Median = 30
Sleep Measures

- Sleep quality *
  - 5 items from the Wisconsin Smoking Withdrawal Scale
    - 1. “I am getting restful sleep”
    - 2. “I awaken from sleep frequently during the night” †
    - 3. “I am satisfied with my sleep”
    - 4. “I feel that I am getting enough sleep”
    - 5. “My sleep has been troubled” †
  - Items were summed to create a composite ranging from 0-20, with higher numbers reflecting better sleep quality

*assessed at baseline, month 1 and 3
† item reversed scored
Smoking Outcomes

- Abstinence: self-report of no smoking for 7 consecutive days and CO ≤ 8
- Drop-outs were classified as having relapsed
Statistical analysis

- Repeated measures, mixed effect models to evaluate sleep over 3 months and by smoking status
- Regression analyses to evaluate whether sleep complaints at baseline, were associated with smoking status at 3 months, controlling for depressive symptoms
- Among women abstinent at 1 month, regression analyses to predict smoking status at 3 months from sleep complaints, controlling for baseline sleep complaints, and baseline depressive symptoms.
- All analyses controlled for treatment group
Results

- 42% of women reported sleep disturbances prior to quitting
- Participants also reported slight drowsiness (mean = 23.1) and insomnia (mean = 13.8)
- Women were moderately satisfied with sleep quality (mean = 11.9)
Results: Sleep Disturbance

- Sleep disturbance did not change over time and was not associated with smoking status
Results: Drowsiness and Insomnia

- Drowsiness (p<.0001) and insomnia (p<.0004) decreased significantly over time
- Women who were smoking at 3 months reported more drowsiness than did those who maintained abstinence, particularly during weeks 7-12
Drowsiness (30+)

Percentage

Week

Smoking status at 3 months
Abstinent 3 months

Time, p = .0001
Smoking status X Time, p = .02
Insomnia (30+)

Percentage smoking at 3 months
Percentage not smoking at 3 months

Time, p = .0004
Results: Sleep quality

- Sleep quality tended to change over time, decreasing through 1 month and improving at 3 months.
- Sleep quality was not related to smoking status over time, although women who remained abstinent by 3 months reported better sleep quality at 3 months post-quit than women who relapsed.
Sleep Quality Over Time

Time, p = .06
Results

- Sleep complaints prior to treatment were not associated with smoking status at 3 months
- Sleep complaints among women quit at 1 month were not associated with relapse at 3 months
Summary

- Subjective sleep complaints among smokers enrolled in cessation treatment vary over time.
- Women who maintained abstinence at 3 months, reported less drowsiness between 1 and 3 months after quitting.
- However, there were no differences in symptoms of insomnia, sleep disturbance, or quality of sleep between women who remained abstinent and those who relapsed.
- Contrary to our hypothesis, sleep complaints were not related to treatment outcome.
Comment

- There is modest support that drowsiness may be important in understanding smoking cessation treatment outcome.
- However, subjective sleep complaints may be a correlate of nicotine withdrawal and may not be uniquely related to cessation outcome.
- Future work using validated measures of sleep complaints as well as objective sleep assessments may help further elucidate the relationship among smoking, sleep complaints and treatment outcome.