

The Association Between Alcohol Consumption and Sleep Patterns in a Population of Young Adults



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INTRODUCTION

It is recommended that adults get 7-9 hours of sleep every single night. However, 35.3% of American adults report that they typically sleep less than 7 hours a night (ASA, 2017). This is an issue because sleep deprivation can affect mood as well as cognitive and motor performance (Pilcher & Huffcutt, 1996). Research pertaining to the relationship between alcohol consumption and sleep deprivation has established that a relationship certainly exists. However, the factors that modify this relationship are not so well-established (Ebrahim et al., 2013). For example, one study indicated that single nucleotide polymorphisms of a circadian rhythm gene may alter the relationship between alcohol and sleep (Comasco et al., 2010). Another found that there was a relationship between moderate alcohol consumption and sleep disordered breathing among men, but not among women (Peppard et al., 2007). On the other hand, Arnedt et al. conducted an experimental study and found that after alcohol consumption, all sleep quality measures were more disrupted in women than in men (Arnedt et al., 2011). Finally, a different study found that “less than weekly” drinkers had trouble initiating and maintaining sleep and experienced early morning awakening whereas “weekly drinkers” only had difficulty maintaining sleep (Huang et al., 2013).

RESEARCH QUESTIONS

- Does alcohol intake affect sleep patterns?
- Is the relationship between alcohol and sleep modified by gender?

HYPOTHESES

- More frequent drinking and greater drinking amounts will be associated with negative sleep outcomes such as more frequent trouble falling asleep and trouble staying asleep.
- Participant gender will modify the relationship between drinking habits and sleep disturbances.

METHODS

Study Design:

- Cross-sectional sample that was derived from the National Longitudinal Study of Adolescent to Adult Health (Harris, 2009).
- Sample consisted of 3665 American adults aged 24-34.
 - Participants were selected to be a nationally representative sample.
- Data were collected from 2008 to 2009 via 90 minute in-home interviews.

Variables:

Drinking Frequency
➤ During the past 30 days on how many days did you drink?

Drinking Amount
➤ Think of all the times you have had a drink during the past 30 days. How many drinks did you usually have each time?

Trouble Falling Asleep
➤ Over the past four weeks, how often did you have trouble falling asleep?
➤ This was dichotomized into Trouble Falling Asleep: Yes/No for logistic regression analyses.

Trouble Staying Asleep
➤ Over the past four weeks, how often did you have trouble staying asleep?
➤ This was dichotomized into Trouble Staying Asleep: Yes/No for logistic regression analyses.

METHODS

Statistical Analysis:

- Chi-square tests were used to assess the relationship between drinking frequency and the sleep outcome variables.
 - Gender was tested a potential moderator.
- Logistic regression was used to investigate the relationship between drinking amount and the dichotomized versions of the the sleep outcome variables.
 - These analyses were expanded into multivariable models.
 - Gender was tested as a potential moderator and confounder.
- All analyses were performed using SPSS version 24.

RESULTS

Sample Characteristics

- Gender is almost evenly split in the sample, which consists of 48% males and 52% females.
- The majority of participants either did not drink in the previous month (17.7%), drank one day a month (17.8%), or drank 2 or 3 days a month (25.7%).
- Most participants reported that they had not had trouble falling asleep in the previous four weeks (44.9%).
- Similarly, most participants reported that they had not had trouble staying asleep in the previous four weeks (42.2%).
- Participant age ranged from 24 to 34 with a mean age of 29.
- Drinking amount per day of drinking ranged from 1 to 18 drinks with a mean of 3.7 drinks.

Table 1. Sample Characteristics (n=3665)		
	n	%
Gender		
Male	1757	48.0
Female	1907	52.0
Drinking Frequency		
None	650	17.7
One day	654	17.8
2 or 3 days	942	25.7
1 day a week	374	10.2
2 days a week	556	15.2
3 to 5 days a week	377	10.3
Every day or almost every day	112	3.1
Trouble Falling Asleep		
Never in the past 4 weeks	1630	44.9
Less than once a week	745	20.5
1 or 2 times a week	693	19.1
3 or 4 times a week	284	7.8
5 or more times a week	277	7.6
Trouble Staying Asleep		
Never in the past 4 weeks	1531	42.2
Less than once a week	690	19.0
1 or 2 times a week	621	17.1
3 or 4 times a week	367	10.1
5 or more times a week	420	11.6
	Mean	SD
Age	29	1.8
Drinking Amount	3.7	2.9

Table 2. Drinking Frequency and Sleep Outcomes			
Sleep Outcome	df	Pearson Chi-Square	P-value
Trouble Falling Asleep	24	36.624	0.048
Trouble Staying Asleep	24	29.663	0.196

Drinking Frequency and Sleep Outcomes

- The proportions of individuals in the various **trouble falling asleep** categories differed significantly by drinking frequency (p=0.048).
- The “3 to 5 days a week” drinking category had a significantly different distribution of participants in each **trouble falling asleep** category from all other drinking frequencies.
 - There was a smaller proportion of those who never had trouble falling asleep (37.5%) compared to other drinking frequencies (42.8-49.2%).
- Gender was moderator for this relationship because the results were no longer significant after stratifying by gender.
- The proportions of individuals in each **trouble staying asleep** category did not differ significantly by drinking frequency (p=0.196).

RESULTS

Drinking Amount and Sleep Outcomes

- Overall, the odds of a participant having **trouble falling asleep** were not significantly influenced by the number of drinks consumed (p=0.074).
 - However, after stratifying by gender it can be inferred that among females, increasing alcoholic beverage consumption by one drink increases the odds of having **trouble falling asleep** 1.089 times (p=0.001).
 - Thus, gender is a modifier of this relationship.
- The odds of a participant having **trouble staying asleep** were not significantly influenced by the number of drinks consumed (p=0.769).

Table 3. Drinking Amount and Sleep Outcomes					
Sleep Outcome	Gender	OR	P-value	CI lower bound	CI upper bound
Trouble Falling Asleep	Males	1.023	0.150	0.922	1.056
	Females	1.089	0.001	1.036	1.146
Trouble Staying Asleep	Males	1.016	0.995	0.985	1.049
	Females	1.049	0.055	0.999	1.101

Multivariable Models

- After adjusting for gender and age, each additional drink consumed increased the odds of having **trouble falling asleep** 1.042 times (p=0.002) and the odds of having **trouble staying asleep** 1.027 times (p=0.046).
- Gender was a confounder for both **trouble falling asleep** and **trouble staying asleep** because drinking amount was only a significant predictor once gender was added to the model.
- Age was neither a significant predictor nor a confounder of these relationships.

Table 4. Multivariable Models Predicting Trouble Falling Asleep and Trouble Staying Asleep		
	Model 1: Trouble Falling Asleep	Model 2: Trouble Staying Asleep
	OR (CI)	OR (CI)
Drinking Amount	1.042 (1.015-1.070)*	1.027 (1.000-1.054)*
Gender	1.526 (1.312-1.776)*	1.679 (1.441-1.956)*
Age	0.992 (0.952-1.034)	1.023 (0.981-1.066)

*p-values: ≤ .05

CONCLUSION

- The hypothesis that increased frequency and amount of alcohol consumption would decrease sleep quality was supported by some, but not all of the analyses.
- As hypothesized, gender did play a role in the relationship between alcohol intake and sleep quality.
 - This is similar to other studies using other sleep quality measures (Pepperd et al., 2007; Arnedt et al., 2011).
- The limitations of the study included the following:
 - The timing of participants' drinking and trouble sleeping occurrences were not recorded.
 - It is unclear whether drinking instances closely proceeded events of trouble falling asleep or trouble staying asleep.

IMPLICATIONS

- Future research should be conducted to determine which relationships between drinking and sleep quality are influenced by gender and other confounders.
- The reverse relationship involving sleep measures as predictors and alcohol consumption as the outcome measure should be investigated.

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