

BACKGROUND

- The demands of a 24-hour service and globalized society have led to an increase in long working hours. This trend has been accompanied by a corresponding rise in sleep disorders.^{1, 2} Subsequently, sedative-tranquilizers have been reported as the third most misused drug class in the U.S.³
- Also, it is common practice to use medications, including prescribed and controlled medicines, for their side effects, such as sedating effects, and for recreational purposes.⁴ Hence, the use of medications with secondary sedating side effects, such as pain medications, anti-histaminic drugs, and anti-depressants, has increased.³ There has been a significant increase in benzodiazepine-related overdose mortality by over 400% between 1999 and 2013.⁵
- The prevalence of long working hours in the U.S. working population is expected to lead to a continuous increase in the use of sleep aid medications in this population with other associated substance abuse to aid sleep.
- However, despite the availability of studies highlighting the relationship between long working hours and the consumption of alcohol,^{6,7} the relationship between long working hours and the use of sleep aid medications has rarely been examined.

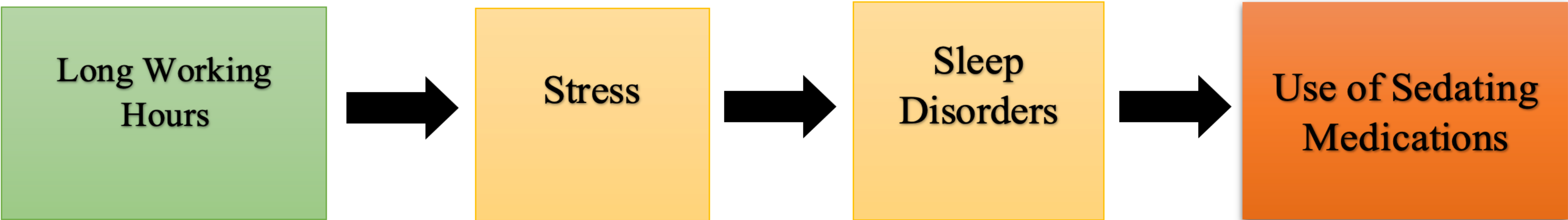
OBJECTIVES

- The key objective of this study was to characterize the relationship between working hours on the use of sleep aids and medications with sedative properties.

METHODS

- We utilized the 2010-2019 Medical Expenditure Panel Survey (MEPS) data from the University of Minnesota’s Integrated Public Use Microdata Series (IPUMS).⁸ The Anderson healthcare utilization model for conceptualizing our research questions.⁹
- Sleep aids and medications with sedation as a side effect were identified. Also, medications with sedation as a side effect were identified using Wolters Kluwer’s Facts and Comparisons®.¹⁰
- We used exploratory, descriptive statistics to examine the distribution of independent variables. We examined the frequency distributions of our study’s participant categorical variables. The continuous variables’ means, standard deviation, median, and interquartile ranges were also assessed. This was followed by examining the distribution of the participant characteristics across both dependent variables (use of sleep aids and use of medications with sedative properties) using the Chi-square test.
- Furthermore, we employed different regression models ranging from multivariable linear regression, Tobit regression, Heckman regression, and multivariable logistic regression to ensure consistency, robustness, and reliability of associations between working hours and the use of medications.

LOGIC MODEL OF LONG WORKING HOURS



RESULTS

Variables	Linear Regression	Tobit Marginal Effect	Adjusted Logit Odds Ratio	Logit Marginal Effect	Linear Regression Among Medication Users
Work hours/week – Use of Prescription Sleep Aids					
≥ 56 h/week	0.046*** (0.021, 0.070)	0.065* (0.015, 0.114)	1.126* (1.008, 1.258)	0.007* (0.000, 0.014)	0.370** (0.128, 0.611)
Work hours/week – Use of Prescription Medications with Sedative Properties					
≥ 56 h/week	0.186*** (0.119, 0.253)	0.114*** (0.065, 0.163)	1.094** (1.032, 1.160)	0.020** (0.007, 0.033)	0.347*** (0.187, 0.506)
Use of Prescription Sleep Aids					
Age (18-26years - REF)					
27-64 years	0.104***	0.305***	2.203***	0.034***	0.513**
≥ 65 years	0.068***	0.251***	1.988***	0.028***	0.256
Race (White - REF)					
Black	-0.127***	-0.313***	0.456***	-0.037***	-0.403***
Other	-0.086***	-0.171***	0.687***	-0.021***	-0.557***
Sex (Male - REF)					
Female	0.014*	0.046***	1.114***	0.006***	-0.022
Marital status (Married - REF)					
Divorced	0.028***	0.053**	1.126**	0.007**	0.064
Unmarried	0.002	0.009	1.035	0.002	-0.098
Family size (≤ 3 Members REF)					
4-6 Members	-0.072***	-0.171***	0.670***	-0.021***	-0.233**
> 6 Members	-0.101***	-0.307***	0.437***	-0.037***	0.071
Education (Less than college - REF)					
Some college or more	0.026***	0.086***	1.235***	0.012***	-0.078
Occupation (Natural resources - REF)					
Hospitality services	0.022	0.02	1.037	0.002	0.234
Trade	0.035*	0.06	1.12	0.006	0.293
Professional services	0.063***	0.123***	1.308***	0.015***	0.338*
Manufacturing	0.049**	0.094**	1.230**	0.011**	0.294
Other	0.041**	0.094***	1.238**	0.011**	0.16

DISCUSSION

- Working 56hours or more per week was significantly associated ($p < 0.05$) with an increased odds of using sleep aids and medications with sedative properties by 13% (Adjusted Odds Ratio, aOR =1.13, 95% Confidence Interval, CI=1.01:1.26) and 9% (aOR=1.09, 95% CI=1.03:1.16), respectively more than that among those who worked fewer hours.
- This is similar to the risk of the onset of risky alcohol use for persons working 55 hours or more per week at 12%.⁶
- Compared to males, females were 11% (aOR=1.11, 95% CI=1.05:1.19) more likely to use prescription sleep aids.
- Professional services had the highest likelihood (aOR=1.31, 95% CI=1.14:1.50) of using sleep medications.
- Sleep medications have been linked with increased mortality.^{11,12}
- The chronic use of sleep aids increases the risk of cognitive and psychomotor impairments, car and workplace accidents, and addiction.^{13,14}
- Also, the residual effects of sleep medications and their resultant effects present safety risks to the workers that use them and the public.

CONCLUSION

- Long working hours are associated with increased use of sedating medications.
- Professional services had the highest likelihood of using sleep medications.
- Female workers had an increased likelihood of using sleep medications.
- Sedating medications use is similar to risky alcohol use in workers.
- There is a need for employee education on the potential health implications of long working hours and using medications for sleep.

REFERENCES

