Work, Leisure, and Other (G-rated) Time Use Before Bedtime in Working and Retired Persons

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ABSTRACT (150 words max)

Many adults routinely experience insufficient sleep due to delayed bedtimes. We analyzed data from the REST (Retirement and Sleep Trajectories) Study to investigate bedtime delaying activities. This Wisconsin-based sample (n=1766, average age=63, 52% female) reported going to bed at 10:24 PM and slept 7.1 hours per night, on average. The most frequently reported bedtime delaying activities are watching television/movies at home (61%), reading for leisure (45%), computer use for leisure (29%), and social activities (31%). Significant predictors of bedtime delaying activities include: working, being female, more education, higher general health, and more depressive symptoms. After adjustment for sociodemographic and health variables, 7 activities were identified as significantly delaying bedtime. For example, computer use for leisure was associated with a 25 minute bedtime delay that was not fully compensated for by sleeping longer or napping. This research indicates that evening time-use patterns may be important determinants of sleep, and therefore health.

EXTENDED ABSTRACT

INTRODUCTION

Many adults routinely experience insufficient sleep. Time-use surveys collectively covering a wide age spectrum show that children, adolescents and adults s trade-off sleep with a variety of activities (e.g., work, television) (Van den Bulck 2004, Basner et al. 2007, Knutson and Lauderdale 2008). Competition between sleep and other activities may be age-specific and especially acute in the hours before intended bedtimes. Therefore, it is important to identify activities within the hours prior to intended bedtimes that are most likely to delay sleep. Therefore, we investigated—in working and retired middle-aged to older adults—the occurrence and socio-demographic predictors of activities explicitly identified as commonly causing delayed bedtimes.

METHODS

Data Sampling Frame

Our data come from the REST study (REST=Retirement and Sleep Trajectories; a study of sleep and retirement that uses subjects from the Wisconsin Sleep Cohort sampling frame). The Wisconsin Sleep Cohort sampling frame was established in 1988 from a sample of 5000 Wisconsin State employees aged 30-60 years old (Young et al. 1993). In 2011, the REST study was initiated targeting a subset of this sampling frame (n=2472) to receive the first annual REST survey. Seventy-three percent of respondents provided usable data.

Data Collection

REST surveys collected data on sleep disorders and habits, health behaviors, medical history, socio-demographics, and other factors. This analysis used the following one-page item from the survey:

Please indicate whether you typically… spend time in the following activities within approximately 2 hours of your bedtime. Also indicate how often these activities keep you up past your intended bedtime.

Responses included the following categories: caring for others, work-related activities, reading for leisure, watching TV/movies at home, computer use for socializing, computer use for other leisure, other social activities, light physical activity, and moderate to heavy physical activity. Each bedtime-delaying activity was classified as binary outcomes: never/rarely delaying bedtime; or sometimes/often/always delaying bedtime.

Data Analysis

First, we performed logistic regression analyses to identify associations between sociodemographic factors and presence or absence of delayed bedtimes for each activity. Then, we estimated the associations between each bedtime-delaying activity with the following sleep-related outcomes – fair/poor satisfaction with sleep, insomnia, bedtime delay (minutes later), sleep time (without naps), and total sleep time (in minutes). Sociodemographic predictors examined included: age, sex, education, employment, and marital status. Regression models additionally adjusted for body mass index, current smoking, alcohol use, depression symptoms, and self-reported general health.

PRELIMINARY RESULTS AND DISCUSSION

The majority of middle-aged to older adults commonly stayed awake past intended bedtimes. Leisure activities (TV-watching, socializing, leisure-reading and computer use) were most responsible for delayed bedtimes. Women, more so than men, reported delaying bedtime to care

for others and read for leisure. Persons with a college education more commonly delayed bedtime to read or use the computer for leisure activities compared to persons without college education. Seven of the nine reported bedtime-delaying activities are associated with a significant delay of actual bedtime, even after adjustment for employment status, age, sex, BMI, educational attainment, marital status, current smoking, alcohol use, CESD (depression score), and SF-36 general health score. The magnitude of these significant bedtime delays varied from 14 to 28 minutes, with the largest bedtime delays coming from work-related activities (22 minutes), computer use for leisure (25 minutes), and moderate to heavy physical activity (28 minutes). Two of the bedtime delaying activities delayed bedtimes to such an extent that they were not fully compensated for by sleeping longer (or napping) – caring for others and computer use for leisure.

In future research with additional waves of the REST surveys, we will be able to examine how bedtime-delaying activities change with longitudinal transition from work to retirement.

This research indicates that evening time use patterns may be important determinants of sleep duration, sleep timing, and therefore overall mental and physical health.

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TABLE 1 Descriptive Statistics by employment status (mean & SD or percent)

	Employed Full time	Employed part time	Retired/Unemployed	All
Age (years)	57.3 (4.5)	64.0 (5.4)	66.5 (6.3)	62.9 (7.0)
Ages between 55 & 65 years	59%	56%	45%	52%
Female	56%	54%	50%	53%
BMI	29.5 (6.6)	28.7 (6.0)	29.8 (6.8)	29.5 (6.6)
Married or living with partner	76%	73%	72%	74%
Greater than HS education	85%	82%	77%	81%
SF-36 General health score	49.7 (8.7)	50.4 (8.9)	47.9 (10.0)	48.9 (9.5)
CESD score	8.2 (8.8)	6.3 (7.8)	7.1 (8.7)	7.4 (8.6)
Sleep quality	3.1 (0.9)	2.9 (0.9)	2.9 (0.9)	3.0 (0.9)
Current smoker	9%	8%	7%	8%
Alcohol drinks/week	4.5 (6.0)	4.8 (6.5)	4.2 (6.1)	4.4 (6.1)
Bedtime (SD is in minutes)	10:32 PM (61)	10:47 PM (62)	10:11 PM (68)	10:24 PM (65)
Total sleep time with naps (hours)	7.1 (0.9)	7.4 (1.1)	7.5 (1.2)	7.3 (1.1)
Sleep time without naps (hours)	6.9 (0.9)	7.1 (1.1)	7.2 (1.1)	7.1 (1.1)
# of insomnia symptoms (range 0-4)	1.0 (1.2)	1.0 (1.1)	1.1 (1.2)	1.1 (1.2)

TABLE 2 Bedtime-delaying activities (percent of persons reporting being commonly kept up past intended bedtimes for each activity) by employment status

	Employed Full time	Employed part time	Retired/Unemployed	All
Caring for Others	10%	5%	5%	7%
Work-related Activities	18%	17%	4%	11%
Reading for Leisure	47%	41%	45%	45%
Watching TV/Movies at Home	65%	57%	60%	61%
Computer Use for Socializing	27%	26%	24%	25%
Computer Use for Other Leisure	34%	25%	27%	29%
Other Social Activities	33%	33%	29%	31%
Light Physical Activity	23%	13%	13%	16%
Moderate/Heavy Exercise	5%	3%	4%	4%

TABLE 3: Odds ratios for predictors of bedtime-delaying activities+ (summary of 9 models, one for each activity)

Outcomes→ Predictors↓	Caring for others	Work-related activities	Reading for leisure	Watching television/ movies at home	Computer use for social-izing	Computer use for other leisure	Other social activities	Light physical activity	Moderate to heavy physical activity
Fulltime vs. no work	2.32**	5.93***	0.95	1.14	0.93	1.17	1.15	1.73**	2.42*
Part-time vs. no work	0.96	5.15***	0.82	0.95	1.04	0.87	1.11	0.94	0.90
Age (10 yrs)	1.32	1.29	1.03	0.92	0.88	0.89	0.99	0.90	1.70*
Female (vs male)	2.00**	1.00	1.72***	0.92	1.20	0.82	1.49***	1.55**	1.26
BMI (5 units)	1.05	1.02	0.95	1.08	1.10*	1.12*	1.02	1.00	0.68**
Education (>HS vs ≤HS)	1.04	1.55	1.50**	0.78	1.18	1.37*	0.99	0.80	0.49
Marital status (living with partner vs not)	1.66*	1.01	1.05	1.07	0.87	0.76	0.83	0.96	1.45
SF-36 general health score (10 units)	1.11	1.07	1.17*	1.06	1.16*	1.15*	1.21*	1.17	0.93
CESD score (10 units)	1.14	1.15	1.26**	1.37***	1.25*	1.17*	1.02	1.19*	1.11
Alcohol (drinks/day)	0.73*	0.72**	0.98	1.13	1.02	1.01	1.15*	0.89	1.13
Smoking (current vs. not)	1.23	0.70	0.81	0.87	0.95	0.78	0.77	1.11	0.30
Insomnia symptoms, range 0-4	0.97	0.89	1.01	1.05	0.96	0.98	1.03	0.99	1.06
Sleep satisfaction, range 1 (excellent) to 5 (poor)	1.31	1.21	1.07	1.08	1.15	1.15	1.03	1.22*	1.15

+Mutually adjusted for all factors in the table

* $p<0.05$; ** $p<0.01$; *** $p<.001$

TABLE 4: Bedtime-delaying activities predicting sleep-related outcomes+. Fair/Poor Satisfaction with Sleep and Insomnia are binary outcomes (predictor parameters are odds ratios), Bedtime and Sleep Time parameters are linear regression coefficients

Outcomes→ Predictors↓	Fair/Poor Satisfaction with Sleep (OR for activity vs. without)	Insomnia (OR for activity vs. without)	Bedtime (minutes later)	Sleep time without naps (minutes)	Total sleep time (minutes)
Caring for others	1.18	1.18	14*	-14***	-15***
Reading for leisure	1.05	1.09	18***	1	0
Watching TV/Movies at home	1.12	1.15	15***	-6*	-5
Computer use for socializing	1.02	1.15	14***	-4	-3
Computer use for other leisure	1.27	1.06	25***	-10**	-8*
Other social activities	0.88	1.15	-5	-1	-3
Light physical activity	1.05	1.26	1	-4	1
Moderate to heavy physical activity	0.93	1.27	28***	6	9

+Adjusted for employment status, age, sex, BMI, educational attainment, marital status, current smoking, alcohol use, CESD (depression score), SF-36 general health score

* $p<0.05$; ** $p<0.01$; *** $p<.001$