



Sleep Dysfunction in Pathological Gamblers

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INTRODUCTION

DSM-IV defines pathological gambling as 'persistent and recurrent maladaptive gambling behavior indicated by five or more [out of ten diagnostic] criteria' (Figure 1) (APA, 1994). The U.S. National Comorbidity study found that 0.6% of U.S. citizens were pathological gamblers, while 2.6% were problem gamblers (met one criteria) (Kessler et al., 2008). Furthermore, the National Gambling Impact Study Commission has reported that the annual societal cost for problem and pathological gamblers is \$5 billion per year with an additional \$40 billion in lifetime costs for productivity reductions, social service, and creditor losses (Gerstein et al., 1999).

In addition to its financial and societal cost, pathological gamblers have been found to have high comorbidity with substance use, mood, anxiety, and personality disorders (Petry et al., 2005). Most of these comorbid mental disorders are also associated with sleep dysfunction (Taylor et al., 2005). However, to the best of our knowledge, there have been no studies investigating sleep dysfunction in pathological gamblers. The purpose of this study is to bridge this gap in literature and provide a foundation for future research regarding sleep dysfunction in pathological gamblers.

Figure 1: DSM-IV Criteria for Pathological Gambling

(must meet five out of ten criteria without being accounted for by a manic episode)

1. Preoccupied with gambling (e.g. preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble)
2. Needs to gamble with increasing amounts of money in order to achieve the desired excitement
3. Repeated unsuccessful efforts to control, cut back, or stop gambling
4. Restless or irritable when attempting to cut down or stop gambling
5. Gambles as a way of escaping from problems or of relieving a dysphoric mood (e.g. feelings of helplessness, guilt, anxiety, depression)
6. After losing money gambling, often returns another day to get even ("chasing" one's losses)
7. Lies to family members, therapist, or others to conceal the extent of involvement with gambling
8. Has committed illegal acts such as forgery, fraud, theft, or embezzlement to finance gambling
9. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling
10. Relies on others to provide money to relieve a desperate financial situation caused by gambling

METHODS

109 subjects participating in an ongoing gambling study were assessed for sleep dysfunction using two self-administered questionnaires. Participants were excluded if they tested positive for drug use, recently changed medications for any psychiatric disorder, or had any medical disorders that could harm them. The inclusion criteria were that subjects had to be 18 years or older, be able to speak and read English, and were not seeking treatment for gambling problems.

Assessments included:

- **DSM-IV Pathological Gambling Checklist:** Interview-style questionnaire that asks ten questions based on the ten DSM-IV criteria for Pathological Gambling. Recent research suggests that the number of criteria met by the participant can be used as a continuum for severity (Strong & Kahler, 2007).
- **Epsworth Sleepiness Scale (ESS):** Eight-item self-administered questionnaire that assesses sleep propensity and quality, and evaluates the level of alertness during awake hours. Scores range from 0-24 and a score greater than 16 indicates a high level of daytime sleepiness. Higher scores on the ESS represent greater levels of dysfunction during the day and have been found to be associated with increased psychological symptom intensity.
- **Pittsburgh Sleep Quality Index (PSQI):** 19-item self-administered questionnaire assessing sleep quality. Scores range from 0-21 and scores greater than 5 indicate significant sleep disturbance. Domains include subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction.

RESULTS

Table 1: Demographics

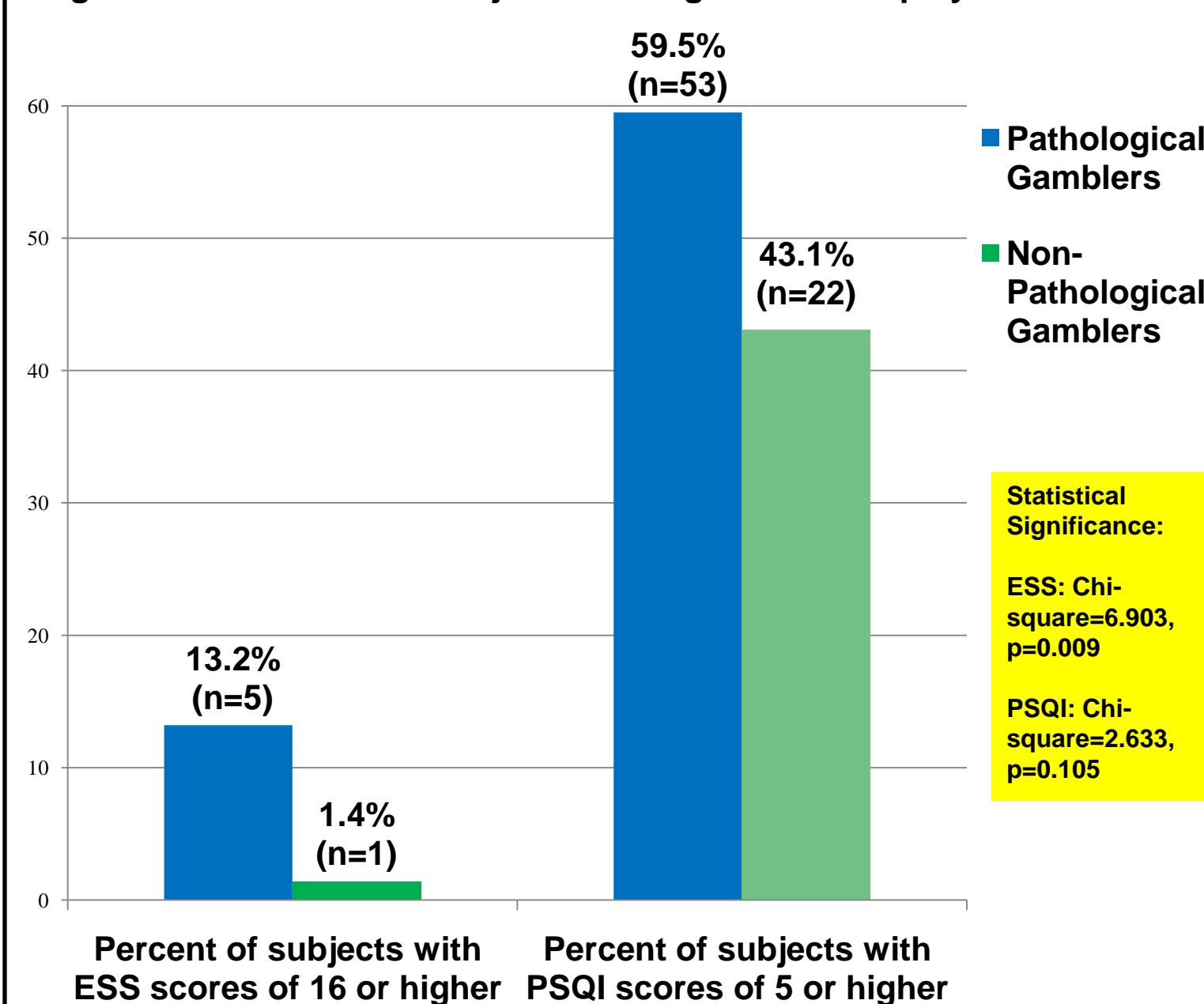
AGE (years)		MARITAL STATUS (%; n)	
- Mean	39.25	- Legally married	17%; 19
- Range	19-71	- Living with partner	6%; 7
- SD	13.32	- Separated	4%; 5
		- Divorced	17%; 19
		- Widowed	4%; 4
		- Never Married	53%; 60
		EMPLOYMENT (%; n)	
		- Full-time	28%; 32
		- Part-time	21%; 24
		- Student	15%; 17
		- Retired / disabled	6%; 7
		- Unemployed	24%; 27
		- Other	5%; 6
		INCOME (%; n)	
		- \$0	12%; 13
		- \$1-\$25,000	43.8%; 49
		- \$25,000-\$50,000	25.9%; 29
		- \$50,000-\$100,000	15.2%; 17
		- >\$100,000	3.6%; 4
EDUCATION			
- Number of years	14.7		
- Range	5-20		
- SD	2.333		

Table 2: Hours of sleep per day

	Mean hours of sleep	SD	Range
All Subjects	7.05	1.29	3.5-11
Pathological Gamblers (n=37)	6.79	1.40	3.5-11
Non-pathological gamblers (n=72)	7.17	1.22	4-9

Pathological gamblers reported sleeping approximately 38 minutes less per day compared to non-pathological gamblers (t=2.043, df=67.289, p=.045).

Figure 2: Distribution of subjects with significant sleep dysfunction



RESULTS

Table 3: Mean differences in sleep scores for pathological gamblers compared to non-pathological gamblers

	Mean difference	t-score	d.f.	p-value
ESS score (0-17)	3.21	3.66	76.47	<0.001
Total PSQI scores (0-14)	1.18	1.80	73.09	0.076
PSQI subset scores: (0-3)				
- Sleep duration	0.23	1.28	64.15	0.207
- Sleep disturbance	0.34	2.79	72.68	0.007
- Sleep latency	0.22	1.13	62.12	0.264
- Day dysfunction due to sleepiness	0.22	1.13	70.05	0.197
- Sleep efficiency	-0.15	-1.08	97.73	0.284
- Use of sleep medications	-0.09	-0.66	96.91	0.509
- Sleep quality	0.47	3.23	76.39	0.002

Table 4: Pearson correlations examining associations between sleep scores and gambling behavior

Variable 1	Variable 2	r (slope)	P value
ESS Score and:			
Number of DSM-IV criteria met		0.328	<0.001
Amount won/lost		0.283	0.003
Gambling more than could afford (days in past 30 days)		0.187	0.049
Gambling more than could afford (months in lifetime)		0.310	0.001
Gambling frequency (days in past 30 days)		0.073	0.445
Total hours spent gambling (in past 30 days)		0.016	0.866
PSQI Score and:			
Number of DSM-IV Criteria met		0.264	0.006
Amount won/lost		-0.127	0.190
Gambling more than could afford (days in past 30 days)		0.120	0.216
Gambling more than could afford (months in lifetime)		0.284	0.003
Gambling frequency (days in the past 30 days)		0.175	0.069
Total hours spent gambling (in past 30 days)		0.239	0.012

CONCLUSIONS

Our findings suggest that pathological gamblers experience more sleep dysfunction compared to non-pathological gamblers. Moreover, gambling severity may be positively associated with severity of sleep dysfunction.

The increased risk for sleep dysfunction among pathological gamblers highlights the importance of screening for sleep dysfunction in this population. Research has shown that people with insomnia, the most common sleep-related disorder, have an increased risk for psychiatric comorbidity (Sarsour et al., 2010), a higher risk of cardiovascular disease (Spiegelhalder et al., 2010), and lower quality of life (Kyle et al., 2010). Consequently, it is important for providers to treat insomnia in pathological gamblers as research has demonstrated that treatment for insomnia is effective (Matteson-Rusby et al., 2010) and can improve quality of life, daytime function and perceived health (Krystal, 2007).

Further investigation is necessary to determine if treatment of sleep dysfunction in pathological gamblers is also helpful in reducing gambling behavior or gambling severity. Nevertheless, this study should increase provider awareness of sleep disorders in pathological gamblers and encourage providers to include sleep dysfunction in their daily assessment and plans.

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