

Insomnia and burnout in Greek Nurses

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Abstract

Background/Aim: Sleep disturbances and burnout are possibly related to each other, although the exact nature of this relationship is still under investigation. The purpose of the study was to investigate the prevalence of insomnia and its relation with burnout levels in a group of nurses working in psychiatric, pediatric, internal medicine and surgery departments in the public hospitals of central Greece.

Methods: One hundred and seventy four nurses working in internal medicine, surgery, psychiatric and pediatric sector in public hospitals of Central Greece were enrolled in the study. Maslach's burnout inventory and Athens Insomnia Scale were used to evaluate burnout and insomnia respectively. Statistical significance was set at $p=0.05$.

Results: Mean age of the nurses was 35.19 ± 7.07 (22-56). One hundred and fifteen (95.8%) nurses were women and 71 nurses (59.2%) were married. Mean insomnia score was 10.00. Approximately 3 out of 4 nurses exhibited high burnout levels. Nurses working in the department of surgery and those with more than 4.5 night shifts per month exhibited higher insomnia scores. Insomnia score was correlated with burnout subscales, positively with emotional exhaustion and depersonalization and negatively with personal achievements scale.

Conclusions: Insomnia and burnout scales are linearly related to each other. Younger nurses are particular vulnerable to insomnia. Job reform should target at younger nurses and those working on surgical departments who might also benefit from additional education and training to reduce insomnia and burnout. Hippokratia 2014; 18 (2):150-155.

Keywords: Professional burnout, insomnia, nurses

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Introduction

Sleep disturbances and burnout are possibly related to each other, although the exact nature of this relationship is still understudied. Biological, emotional exhaustion and fatigue is thought to be closely related^{1,2}. Self report studies suggest that individuals with high burnout levels exhibit poorer sleep quality. Especially women scoring high on burnout report greater sleepiness, impaired sleep quality, and more frequent awakenings than those scoring low³. Armon et al, have demonstrated that untreated burnout affects sleep and a vicious circle of a new fatigue source begins, which increase chronicity⁴. The results of that study indicated that burnout and insomnia recursively predict each other's development and intensification over time, thus suggesting that either might be a risk factor for the other across time. Although a bidirectional link of insomnia and burnout is still under question, a persistent association between burnout and insomnia has been established^{1,5}.

Self-report studies' findings are highly correlated with objective measures, such as polysomnography. A study using polysomnographic sleep measures found an increased number of arousals in young individuals with

high burnout scores, in comparison to their counterparts with low burnout scores. Burnout groups also show greater sleep fragmentation, lower sleep efficiency, less slow wave and Rapid Eye Movement (REM) sleep, lower delta power density in non REM sleep and finally lower subjective sleep quality⁶.

Working on nightshifts has been well recognized as a risk factor for sleep disturbances⁷. Studies have shown that workers on cyclical or permanently night shift often complain of sleep problems. Such problems are difficulty in initiating and / or maintaining sleep, as well diminished sleep duration⁸. Working at nights affects sleep quality⁹. Moreover, serious health problems were observed in night workers in comparison to day time workers. It is thought that a long term adaptation to night shift working is extremely restricted or even inevitable¹⁰. A comparative study of nurses working in night shifts and those working in day time showed that night shift workers had poor sleep quality and exhibit higher fatigue rates in comparison to the remainders¹¹. The night shift has been associated with a higher incidence of varicose veins, appetite disturbance and sleep disorders.

Fatigue during the day and sleepiness may be of special interest in some groups of workers, whose job is highly demanding. Sleep deprivation has considerable consequences upon people's personal life as they often postpone many personal and social activities, even those offering psychological satisfaction¹². It also influences their job performance and subsequently their professional achievements¹³. Poor sleepers are more likely to have higher anxiety, feelings of depression, and a poor working atmosphere. Inadequate sleep and sleep disturbances result in low productivity.

Health professionals fall into this category, as mistakes due to fatigue could be fatal. In a recent study, Bonet-Porqueras et al. found that one out of four nurses experienced serious sleep disturbances¹⁴. Other studies have confirmed these results among doctors as well. According to a study in Pennsylvania, USA, the percentage of long term sleep deprivation surged to 43% during residency (from 9% at the beginning) and serious psychological distress was traced². In another study, sleep disorder symptoms varied between 6% and 53% among nurses and nursing aides⁷. Given that burnout is highly prevalent among health professionals¹³, its possible effect on sleep and fatigue may be of clinical importance raising questions about clinical efficiency of health professionals with high burnout levels. Inadequate sleep may jeopardize health professionals' efficacy to handle of critical situations. A poor quality sleep has been identified as risk factor for nursing turnover¹⁵.

Nevertheless, few studies have explored the relation of burnout and insomnia in health professionals, whereas data on insomnia and burnout in nurses are lacking. The aim of the present study was to investigate the prevalence of insomnia and its relationship with burnout levels in a group of nurses working in clinical settings in the public hospitals of central Greece. The following research hypotheses were formulated: a) Is insomnia prevalent among nurses? b) Are number of night shifts per month and working on weekend days related to higher insomnia scores? c) Is insomnia score related to hospital department? d) Is insomnia score correlated with burnout subscales?

Methods

The study took place in the region of Thessaly, central Greece. All the surgery, psychiatric, internal medicine and paediatric departments from the four general public hospitals and the one tertiary public hospital were invited to participate in the study. One hundred and seventy four nurses of the 240 registered nurses serving in the above sectors (response rate 72.5%) were enrolled in the study and data were collected between 14-3-2010 until 14-4-2010). The term «shift work» included both long-term night shifts and work schedules in which employees rotated shifts.

Ethical approval

Ethical approval was given with the F.900/EKEPY/703 decision of the local ethical committee.

Inclusion criteria

All hospitals were public, with the same duty shift scheme, in order sample homogeneity to be achieved. All hospitals belonged to the same health region of the country, for the very certain nurse population to be investigated. Written permission was obtained from heads of the department. A minimum of one year longevity in the hospital (in a clinical setting) was another criterion, so as a minimum of experience in the particular work place was guaranteed. Participants were recruited through personal communication with one of the researcher.

Instruments

The Athens Insomnia Scale (AIS) was used to assess insomnia¹⁶. It is a self-reported psychometric instrument designed for quantifying sleep difficulty based on the ICD-10 criteria. It consists of eight items: the first five pertain to sleep induction, awakenings during the night, final awakening, total sleep duration, and sleep quality; while the last three refer to well-being, functioning capacity, and sleepiness during the day. Each item is scaled from 0 to 3. A total score equal or greater than 6 suggests inadequate sleep. In the present study, AIS a Cronbach was found equal to 0.91. The AIS-8 items include sleep induction, awakenings during the night, final awakening, total sleep duration, sleep quality, well-being during the day, functioning during the day, and sleepiness during the day.

The Maslach's burnout inventory was used to assess burnout¹⁷. It consists of 22 items estimating three dimensions regarding the emotional exhaustion, the personal accomplishment and the depersonalization of workers. It is a seven Likert type questionnaire from «never happens» to «it happens every day». It has been translated and evaluated for Greek population¹⁸. Cut-off values for the three dimensions of burnout have been proposed for the Greek population by Anagnostopoulos & Papadatou¹⁹. These values are used in our study, as presented in Table 2. In the present study, MBI a Cronbach was found equal to 0.85.

Statistics

Descriptive statistics was initially generated for sample characteristics. To check differences between two groups, if Student's t-test conditions were violated, Mann-Whitney U test was applied instead. To test for differences between the four departments ANOVA was performed. To discriminate between burnout levels we used a table provided by Papadatou, Anagnostopoulos and Monos referring to burnout components in health professionals in Greece, classifying burnout in low, moderate and high category¹⁸. More specific Emotional exhaustion is considered low when score is ≤ 20 , moderate (score between 21-30) and high (score ≥ 31). Personal accomplishment is considered low, moderate and high when score is ≥ 42 , between 41-36 and ≤ 35 respectively. Depersonalization is considered low, moderate and high when score is ≤ 5 , between 6-10 and ≥ 11 respectively. Spearman's correlation test was used to explore bivariate correlations between burnout subscales and insomnia score. The grouping for

t-tests was made by median split. A generalized linear regression model for job features and insomnia score was created including variables on which subgroups differed at $p < 0.1$. Statistics was processed with SPSS version 17.0 for Windows (SPSS Inc., Chicago, IL, USA). Statistical significance was set at $p = 0.05$.

Results

Description of participants

Mean age of the nurses was 35.19 ± 7.07 (min/max 22-56). One hundred and sixty three (93.6%) nurses were women and 116 nurses (66.6%) had children. As shown in Table 1, 47 (27%) worked in internal medicine sector, 48 (27.6%) in pediatrics, 54 (31.0%) in surgery departments and 25 (14.4%) in the psychiatric departments. 26 (14.9%) nurses had some kind of postgraduate education; 27.6% had at least one to five year longevity, while 60.7% reported that more than 75% of their shift was dedicated to direct nursing care. One hundred and forty six (84.0%) were clinical nurses, whereas 28(16.0%) persons occupied a head/ supervisor position (Table 1). The median values of night shifts and weekend working days per month were 4.50 and 3.30 respectively (data not shown).

Insomnia results and factors related to insomnia

Regarding insomnia scale results, mean insomnia score was 10.28 (± 5.78). The highest score was observed in questions 1, 6 and 8 (sleep initializing, total duration and next day somnolence (1.28, 1.40 and 1.53 respectively-data not shown). No statistical differences were observed in total score between the four departments.

Burnout results and factors related to burnout

Approximately 3 out of 4 nurses exhibited high burnout levels. Highest percentages were noted in depersonalization scale, without statistically significant differences observed between the three departments (Table 2). Longevity in current position, weekend working days and age were statistically related to insomnia, when nurse subgroups were created depending on demographic/ job features (median values as dichotomous). Nurses working more than 4.5 night shifts per month, those working more than 3.0 weekend days and those working in surgery departments exhibited higher insomnia scores at $p < 0.01$ (Table 3).

Table 1: Workplace, longevity and educational status of the 174 participants.

Department	n	%
Internal medicine	47	27.0
Pediatric	48	27.6
Psychiatric	25	14.4
Surgery	54	31.0
Total	174	100.0
Post graduate nursing education		
Master / Doctoral degree	1	0.5
Nursing specialty	25	14.4
None	148	85.1
Total	174	100.0
Longevity(yrs)		
1 - 5	48	27.6
6 - 10	32	18.4
11 - 15	28	16.1
16 - 20	22	12.6
21 - 25	10	17.8
>30	3	5.7
Total	174	100.0
Time spent on immediate nurse care		
<25%	29	16.8
50%	39	22.5
75%	39	22.5
85%	45	26.0
95%	22	12.2
Total	174	100.0
Rank		
Nurse	146	84.0
Shift supervisor	15	8.6
Head	13	7.4
Total	174	100.0

Table 2: Whole sample burnout dimensions score-descriptive statistics.

Emotional exhaustion				Personal accomplishment				Depersonalization			
		n	%			n	%			n	%
Low	≤ 20	29	16.7	Low	≤ 35	119	68.4	Low	≤ 5	18	10.3
Moderate	21-30	14	8.0	Moderate	41-36	40	23.0	Moderate	6-10	14	8.1
High	≥ 31	131	74.4	High	≤ 42	15	8.6	High	≥ 11	142	81.6
Total		174	100.0	Total		174	100.0	Total		174	100.0

Table 3: Insomnia in relation to demographic/ job features.

Nurses' Variables		N	Insomnia score Mean \pm SD	p
Gender	Women	163	10.30 \pm 5.66	NS**
	Men	11	10.00 \pm 7.73	
Age	≤ 34	73	10.73 \pm 5.06	NS*
	> 34	101	9.96 \pm 6.26	
Children	Yes	116	10.08 \pm 5.59	NS*
	No	58	10.68 \pm 6.18	
Nursing postgraduate education	Yes	25	11.04 \pm 6.97	NS**
	No	149	10.16 \pm 5.57	
Median value of night shifts per month	≤ 4.5	92	8.76 \pm 5.65	$< 0.001^*$
	> 4.5	82	12.00 \pm 5.48	
Median value of weekend days work	≤ 3.0	106	9.37 \pm 5.84	$< 0.01^*$
	> 3.0	68	11.72 \pm 5.44	
Longevity in the current position	≤ 5 yrs	18	9.72 \pm 6.63	NS**
	> 5 yrs	156	10.41 \pm 5.60	
Department				
	Internal medicine	47	9.65 \pm 4.43	0.059***
	Pediatric	48	9.41 \pm 5.44	
	Psychiatric	25	9.32 \pm 6.10	
	Surgery	54	12.05 \pm 6.69	

*T-test, **Mann-Whitney-U test, ***ANOVA, SD: Standard deviation, NS: Non Significant

Associations between burnout and insomnia

Insomnia score was correlated with burnout subscales, positively with EE (Emotional Exhaustion) and DEPERS (Depersonalization) and negatively with PA (Personal achievement) (Table 4). Number of night shifts per month and working sector were statistically significantly related to insomnia score ($p=0.002$) in a generalized linear regression model including number of night shifts per month, number of weekend days work per month and sector. Total insomnia score was statistically significantly lower in nurses working in internal medicine department and pediatric department when compared to their counterparts working in surgery department at $p=0.009$ and $p=0.004$ respectively (Table 5).

Discussion

The aim of the present study was to investigate differences in the prevalence of insomnia symptoms between nurses working in different (non-lab) sectors and to attempt to correlate insomnia and burnout in nurses. Over 50% of nurses experience serious sleep problems, whereas number of night shifts was correlated with a greater score of insomnia. An association between insomnia and burnout dimensions score was observed.

Sleep problems and health professionals

Our results showed a high percentage of sleep distur-

bances among nurses. Similar findings have been reported elsewhere. Lee had studied 316 female nurses working a permanent day time shift, 195 women on a permanent afternoon shift and 178 working at night. 71 women working on a cyclical shift were also included. Nurses working on a cyclical schedule and the younger ones reported less satisfaction with their shift in comparison to those working on a permanent shift, regardless of time of the day. 29 % had reported sleep problems, whereas 31 % had reported sleep problems in the past. Younger women and those working at night were more probable to exhibit sleep disturbances. However, regardless of shift, most nurses reported sleep disturbances as a result of their children caring, whereas older nurse's attributes part of sleep disturbances to menopausal symptoms⁸.

Psychological distress and sleep disturbances

According to the results of the present study, psychological distress, as reflected on burnout scores, was associated with sleep disturbances. Sleep disturbances and especially the subjective perception of them are often associated with psychological distress. In patients with major mood and anxiety disorders, difficulties in initializing sleep and arousals have been observed²⁰⁻²⁴. Ekstedt et al. examined individuals with professional burnout and healthy controls. Sleep diaries and polysomnography were used⁶. Results showed that burnout group exhibited

Table 4: Insomnia correlations with burnout subscales.

			EE [‡]	PA ^{‡‡}	DEPERS ^{‡‡‡}
Spearman's rho	Insomnia	Correlation Coefficient	0.710**	-0.552**	0.745**
		Sig. (2-tailed)	0.000	0.000	0.000
		N	174	174	174
	EE	Correlation Coefficient		-0.550**	0.920**
		Sig. (2-tailed)		0.000	0.000
		N		174	174
	PA	Correlation Coefficient			-0.572**
		Sig. (2-tailed)			0.000
		N			174

** Correlation is significant at the 0.01 level (2-tailed), [‡]Emotional exhaustion, ^{‡‡}Personal accomplishment, ^{‡‡‡}Depersonalization,

Table 5: Regression model for insomnia determinants.

Parameter	B	Std. Error	p	Exp(B)	95% Wald Confidence Interval for Exp(B)	
					Lower	Upper
(Intercept)	14.414	0.925	<0.001	1819363.30	296616.35	1.116x 10 ⁻⁷
[Internal Medicine department]	-2.806	1.082	0.009	0.060	0.007	0.504
[Psychiatric department]	-2.248	1.313	0.087	0.106	0.008	1.384
[Pediatric department]	-3.059	1.070	0.004	0.047	0.006	0.383
[Surgery department]	0			1		
[Median value of night shifts per month ≤4.5]	-3.175	0.911	0.000	0.042	0.007	0.249
[Median value of night shifts per month > 4.5]	0			1		
[Median value of weekend days work ≤3.0]	-0.858	0.931	0.357	0.424	0.068	2.630
Median value of weekend days work >3.0]	0			1		

Std. Error: Standard Error

more waking episodes, a lower duration of slow wave and REM sleep and poor sleep quality. Fatigue and somnolence have been more intense in high burnout groups, while insomnia was associated with all three burnout dimensions. A Swedish study in 2008 found that health professionals with burnout had problems with sleep initializing frequent arousals²⁵. In a recent study, Jansson-Fröjmark and Lindblom (2010) found that insomnia was related to emotional exhaustion persistence, whereas no

relation to gender, age, anxiety or depression was traced⁵. So, if psychological distress accounts for emotional exhaustion, insomnia, which is also related to employee's psychological distress, once established, contributes to chronicity of emotional exhaustion²⁶. A survey in Pennsylvania attempted to explore a possible relationship between sleep deprivation and mood disorders, empathy and burnout in physicians. The long term sleep deprivation was associated with an increase in moderate depres-

sion (to 29.8% from 4.3% at the beginning, while burnout reached 55.3% (from 4.3%), a fact indicating a possible relationship between persistence of insomnia and burnout².

A survey in 240 doctors in Spain revealed a clear association between insomnia and burnout. Poor sleep quality and high insomnia levels were traced in the high burnout group²⁷. In the study of Armon, it was shown that burnout and insomnia predicted each other over an 18 months period, even after controlling for the job demand control-support model²⁸.

Burnout and insomnia seem to be related to one another, although a causal, bidirectional relationship between them two is questionable. Nevertheless, the increase of one is frequently associated with a proportionate increase of the other, resulting in a vicious circle that may affect nurse's professional performance.

Limitations

The cross sectional design of the study precludes evaluation of the temporality and causality of the observed relationships. Although empirical research has indicated that self-report measures of insomnia are highly correlated with objective measures, this survey was based only on self reports and objective measures of sleep, such as actigraphy were not used. Also there was no control for the effect of individual differences, such as negative affect. Individual differences might have affected the relationship between sleep and burnout and the shared method variance was a weakness of the study.

Conclusions

According to our study, insomnia and burnout scales are related to each other. Moreover, nurses working more than 4.5 night shifts per month and nurses working in surgery department are particular vulnerable to sleep disturbances. Nurses working in different sectors exhibit different burnout levels and those working in non-lab sectors exhibit high burnout levels.

Conflict of interest

None declared.

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