Research Article

Prevalence of Sleep Disorders and Their Consequences on the Performance of Healthcare Workers in the National Hospital and University Centre (NHUC) in Benin

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Abstract

Objective: Better understanding the sleep-related diseases suffered by workers of the National Hospital and University Centre (NHUC), in Benin.

Methods: A descriptive, cross-sectional study involved 298 workers randomly selected from the 1048 agents of the NHUC. It lasted from 1st July to 30th September 2016. The data collected was stripped and captured using Epidata software and statistical analyses with SPSS.17.0 software.

Results: The average age of the sample was 37.8 years 0.6 with 55.7% of men. The prevalence of chronic debt of sleep was 67.1% and 14.8% of those workers took medication to facilitate occurrence of sleep. 66.8% were sleepless. Several factors are associated with insomnia; alternate shift workers had more insomnia than fixed shift workers (p=0.04); workers had great difficulty concentrating (p=0.04) and excessive daytime fatigue (p=0.002). For the Obstructive sleep apnoea-hypopnoea syndrome (OSAHS), its frequency was 23.5%. This frequency increased with age. The female sex was dominant: 32.9% in the evocative symptoms of OSAHS. The factors associated with this were: the antecedent of high blood pressure OR= 2.37 (IC 95% [1.02-5.52]), the consumption of a lot of alcohol OR=4.12 (IC 95% [1.03; 16.46]).

Conclusion: Sleep disorders remain a pathology to which very little attention is given in the health care system and especially in professional fields. The present study is now shedding light on it back in order to encourage the development of national and adapted control strategies to reduce the drawbacks of that on the country's economy.

Keywords: Insomnia; OSAHS; Workers; Associated factors; NHUC; Benin

Introduction

The rapid pace of life among other things, school and professional constraints led to a shortening of the rest period while the need for sleep remained unchanged. The sleep disorders which result from that particularly insomnia and fatigue are very often encountered [Marques, DMT, 2010] [1]. Sleep disorder is defined as any disturbance in the quality and/or quantity of sleep. The different sleep disorders have important diurnal repercussions on the quality of living [2]. In addition to insomnia, other disorders include obstructive sleep apnoea, excessive sleepiness and narcolepsy. The consequences of insomnia have been identified as the most important health problem in modern society among workers with alternate working hours: this is the case for health workers. Those consequences lead to increased mortality, morbidity, accidents, errors, absenteeism in the workplace, lower productivity and deterioration of personal and professional relationships [3-5]. Working in alternate hours induces many complaints: insomnia, poor quality of sleep, Excessive Daytime Sleepiness (EDS). From another perspective, sleep disturbances reduce the ability of workers to adjust to shift work and consequently increase work-related accidents [6,7]. It is in order to better understand those situations and to remedy them that we undertook this study whose overall objective was to evaluate the sleep disorders and their consequences in a hospital environment: The National Hospital and University Centre (NHUC) of Benin. We will focus on sleep disorders related to our study, especially insomnia, and Obstructive Sleep Apnoea Hypopnea Syndrome (OSAHS).

Methodology

It was an observational, descriptive, cross-sectional study that took place from September 1st to October 1st, 2016. This involved the staff of the Cotonou reference hospital. The sample size was 298 participants and was determined by Daniel Schwartz's formula.

Of the 1043 NHUC workers, 212 are in the administration. A proportional distribution based on the size gave us 61 workers of the administration and 237 workers of the technical platform to investigate. The sampling was probabilistic, randomly and systematic. The data collection was done using a mix of four different questionnaires: questionnaire on the sleep, from the sleep and vigilance centre Hôtel-Dieu in Paris, questionnaire of Berlin, the Quality Index of the Pittsburgh Sleep (PSQI) and the Epworth Scale: This scale assesses the risk of falling asleep in eight situations of everyday life. Somnolence is thus rated from 0 to 24. With the score ≤

11, it is then Excessive Daytime Sleepiness (EDS), which is considered severe with the score ≥16.

The questionnaire included: Personal data, sleep data, habits: we studied the habits of the staff related to sleep: thus were asked for the usual time to go to bed and to get up, the need for sleeping pills, the real average time of sleep at night; consumption of alcohol, coffee and cigarettes. The questionnaire also included the various sleep disorders of the staff. So were considered as:

• Insomniac any person meeting at least one of the following criteria: sleep time longer than 30 minutes, night awakening higher than 3, early awakenings, feeling of tiredness after a night of sleep.

• Suspected of sleep apnoea, anyone who snores at night and/or has respiratory pauses during sleep. The snoring might be louder than the voice when the person speaks, or it might very loud and noticeable in neighbouring rooms, or disturbing someone else or still happening almost every night or 3 to 4 nights a week. As for the breathing pauses, they will have to happen almost every day or 3 to 4 times a week. Also, we studied the possible disadvantages of different sleep disorders on staff by assessing: excessive daytime sleepiness by the Epworth scale, the occurrence of error during the various activities of the day, the lack of concentration during those activities, and daytime fatigue.

The data collected was first analysed and then computerised using the EpiData software. Statistical analyses were conducted with SPSS 22.0 software. The Chi2 test was used for comparisons of quantitative variables. Finally, we performed a multivariate logistic regression analysis with the dependent variable as the presence or absence of a sleep disorder in the worker. The threshold of significance retained was ≤5%.

Results

Socio-demographic, socio-professional characteristics and sleep patterns

The average age was 37.8 ± 0.6 years. The extreme ages were 19 and 67 years old. The sex ratio was 1.26 in favour of men. Most respondents were married: 76.2% and 20.8% of them were moderately obese. The majority of the population used to go to bed (65.1%) between at 10:00 pm and midnight; and get up (53.36%) from 4:00 am to 6:00 am. They would usually sleep between 3 hours and 6 hours each night, Table 1.

Prevalence of sleep disorders and OSAHS

The prevalence of insomnia, sleep disturbance and OSAHS is respectively 66.78%, 47.32% and 23.49%.

Associated factors with insomnia

There is any influence on the insomnia with age, sex, marital status, and occupational category p>0.05). The Epworth score, the error aren't consequences of the insomnia, the work schedule, the difficulty to concentrate, and the daytime fatigue are associated with insomnia, Table 2. After multivariate analysis, no factors are associated with insomnia. Nevertheless, we noted that hypertension, difficulty to concentrate and the error during the work increase the risk of insomnia, Table 3.

Table 1: Population distribution by socio-demographic, socio-professional characteristics and sleep patterns.

Variables		Number	%
Sex	Male	166	55.7
	Female	132	44.3
BMI (kg/m²)	< 18.5	8	2.9
	[18.5; 24.9]	131	46.9
	[25; 29.9]	82	29.4
	≥ 30	58	20.8
Alcohol	Not at all	125	41.9
	A little	163	54.7
	Many	10	3.4
Coffee	Not at all	173	58.1
	A little	110	36,9
	Many	15	5
Occupational category	Technical	237	79.5
	Administrative	61	20.5
Work schedule	Fixed schedule	188	63.1
	Alternated schedule	110	36.9
Time for bedtime	Before 10 :00 pm	42	14.1
	Between 10 :00 and 00h pm	194	65.1
	After midnight	62	20.8
Time to get out of bed	Before 4 :00 am	6	2.01
	Before 4: 00 et 6:00 am	159	53.36
	After 6:00 am	133	44.63
Amount of sleep	Less than 3: 00	10	3.36
	Between 3 et 6 :00	190	63.76
	More than 6 :00	98	32.89

Table 2: Associated factors to sleep disorders and their consequences.

Variables		Insomnia		No insomnia		p
		n	%	n	%	
Work Schedule	Fixed	117	62.57	70	37.43	0.04
	Alternate	82	73.87	29	26.13	
Excessive Daytime Sleepiness (EDS)	No EDS	15	75	5	25	0.13
	EDS Proved	65	59.63	44	40.37	
	EDS Severe	119	70.41	50	29.59	
Difficult to concentrate	Not at all	132	67.01	79	79.8	0.04
	A little	61	30.96	20	20.2	
	Many	4	2.03	0	0	
Error	Never	50	59.52	34	40.48	0.18
	Sometimes	123	68.33	57	31.67	
	Often	25	75.76	8	24.24	
Daytime fatigue	Yes	28	14.14	3	3.06	0.002
	No	170	85.86	95	96.94	
	Technical	166	66.14	85	33.86	

Table 3: Result of the multivariate analysis of insomnia.

Variables	Modalities	OR [CI]	OR Adjusted [CI]	p
Hypertension	No	Ref		0.16
	Yes	2.43 [0.97; 6.10]	1.99 [0.76; 5.17]	
Epworth score	No EDS	Ref		
	EDS Proved	0.49 [0.17; 1.45]	0.41 [0.14; 1.24]	0.12
	Severe EDS	0.79 [0.27; 2.30]	0.65 [022; 1.92]	0.43
Difficult to concentrate	Not at all	Ref		
	A little	1.83 [1.02; 3.25]	1.72 [0.94; 3.13]	0.08
Errors during work	Never	Ref		
	Sometimes	1.47 [0.86; 2.51]	1.17 [0.66; 2.07]	0.59
	Often	2.13 [0.86; 5.27]	2.21 [0.88; 5.59]	0.09

Table 4: Results of the multivariate analysis of OSAHS.

Variables	Modalities	OR [CI]	OR Adjusted [CI]	p-value
Sex	Male			
	Female	0.53 [0.30; 0.94]	0.63 [0.34; 1.16]	0.14
Age group (years)	< 30			
	[30 ; 40]	2.33 [0.99; 5.48]	1.48 [0.54; 4. 09]	0.45
	[40 ; 50]	4.29 [1.73; 10.67]	2.47 [0.82; 7.42]	0.11
	≥ 50	4.45 [1.74; 11.39]	1.89 [0.58; 6.20]	0.29
Hypertension	No			
	Yes	3.18 [1.51; 6.71]	2.37 [1.02; 5.52]	0.04
Alcohol consumption	Not at all			
	A little	1.06 [0.61; 1.87]	0.97 [0.53; 1.76]	0.92
	Much	5.44 [1.43; 20.69]	4.12 [1.03; 16.46]	0.04

Associated factors with OSHAS

Were associated with the OSAHS: Age (p= 0.003), sex (p=0.02), marital status (p=0.003) history of hypertension (p= 0.002), alcohol consumption (p= 0.03) and the BMI (p= 0.004). But after multivariate analysis, only hypertension and alcohol consumption are associated, Table 4.

Discussion

Bedtime and wake-up time: The frequency of workers who slept between 10pm and midnight was 65.1%. This result is lower than the 84.7% observed among daytime workers determined by Guzman [8] in a cross-sectional study on the epidemiology of sleep disorders in the Tarn and Aveyron (French Republic) about 2117 adults in 2013. On the contrary, 53.4% of workers got up from bed between 6am and 8am; and this result is also lower than the 89.2% observed by Guzman in the same study. Those results, although nominally lower, are consistent with the predominance of bedtime and wake-up time within those different periods among the worker as shown by Guzman. Those differences in frequency can be explained by the size of the sample which is larger because the duration of the study also is longer in the study by Guzman.

Chronic sleep debt

There are no standards regarding sleep duration because each individual has his own need for sleep and there is no universal definition of chronic sleep debt. However, it is known that the majority of adults are satisfied sleeping for about 7 hours [9] according to polysomnographic studies in healthy adults. 67.1% of NHUC workers had a chronic sleep debt, that is, they slept no more than six hours of time on average each night. This result is well above the 30% obtained in the various INSV annual surveys [10-13]. That great difference between the results of the French studies and ours can be explained by various theses. First of all, the difference in the study frameworks, indeed our study was carried out in a hospital environment where taking over shift and giving health care during the night induce a reduction of sleep time per night, whereas the French studies were carried out in the general population. Second, the restriction of sleep time can be involuntary: many sleep pathologies induce a decrease and fragmentation of sleep nights (insomnia, OSAHS ...); however, the proportion of NHUC workers with insomnia or OSAHS is large. Thirdly, the reduction of sleep time can be voluntary due to many social, professional or family constraints.

Insomnia

Frequency: In Europe or the United States, the prevalence of insomnia can vary between 9 and 50% depending on whether we need to know about the occurrence of sleep disorders, sleep dissatisfaction or whether we use more stringent criteria like the consumption of hypnotics.

The frequency of insomnia in our study was 66.8%. That frequency is higher than all the ones that are observed in the literature. Indeed, Gureje, et al. [14] found that 11.8% of the general population had insomnia during the survey on mental health and well-being, which was conducted in 21 states of Nigeria in 2007. Morin, et al. [15] had shown that 29.9% of the general population had insomnia in a telephone survey conducted in 2001 with French-speaking Canadians in 2006. Nakata, et al. [16] also found 23.6% of insomniacs during the study on the prevalence of insomnia in a population of daytime workers in Japan in 2004. The high frequency of insomnia in our study could be explained for two reasons:

• The definition of insomnia: we defined the prevalence of insomnia as the proportion of workers who meet at least one of the following criteria:

• More than 30 minutes of sleep, more than three hours of night-time wake-up, early morning awakening, feeling tired after a night's sleep (daytime fatigue after a night's sleep 3 to 4 days a week or almost every morning. We decided to study the last two symptoms, in addition to the first two ones which have the advantage of being less subjective and common to the three nosological systems presenting a definition of insomnia. This definition would partly explain that high frequency of insomnia.

• The study setting and the target population: this study is carried out among the workers of a hospital. Unlike other studies that took place either in the general population or among workers in general. Thus, the specificity of hospital work, including alternate working hours and a reduction in sleep time per night, could explain that high frequency of insomnia.

Factors associated with insomnia

Work Schedule: In our study, 73.9% of shift workers were insomniac compared to 62.6% of those working on a fixed schedule.

Insomnia was statistically associated with work schedule (p = 0.04). The proportions of insomniac workers are so close because in the base study population, 63.1% of workers had a fixed work schedule.

The fact that there are more fixed-time workers in our study is explained by the fact that during the survey we had met more part-time NHUC workers than contract workers.

Difficulty concentrating

100% of workers who had a lot of difficulty concentrating were insomniacs compared to 62.6% of workers who had no difficulty concentrating at all. Difficulty concentrating was statistically related to insomnia (p = 0.04). Metlaine and Prévot reported that insomnia is the predicting factor of difficulty concentrating (absenteeism) [17], and at the same time they showed that absenteeism is multiplied by 4.5 for the insomniac worker; Léger, on the other hand, estimates that 88% of the indirect cost of insomnia in France is borne by the employer, because of the difficulty concentrating or work accidents subsequent to insomnia [18].

Daytime fatigue: Fatigue in the middle of the day after a night's sleep was statistically associated with insomnia (p = 0.002). Indeed, in our study 90.3% of workers who had daytime fatigue were insomniacs. The particular setting of our study explains this result; and that is due to the fact that there was a chronic sleep debt among those workers inducing daytime fatigue in the day after work in the hospital.

OSAHS (Obstructive Sleep Apnoea Hypopnoea Syndrome)

Frequency: The frequency of OSAHS in our study was 23.5%. This result is superior to the one by Pépin and Tamisier [19] in general population, who found that about 5% of the population had symptoms of OSAHS, and superior to the studies by Bixler et al., Duran et al., Young, et al. [20-22] who showed cases of prevalence ranging from 3 to 7% in the general population. The difference between our results and the one by Pépin and Tamisier is explained by the fact that, although they were based on a questionnaire like ours, to determine the prevalence of OSAHS, they introduced in the evocative symptoms studied Excessive Daytime Sleepiness (EDS) in addition to snoring and respiratory apnoea that our studies had in common; that would explain the rise of the frequency in our study. However, during the other three studies, in addition to answering the questionnaire in the first phase, a second phase was planned for in which patients with symptoms of OSAHS had benefited from polysomnography, which could also explain the fact that we had a higher frequency.

The frequency of 23.5% that we obtained during our study was lower than the 79% obtained by Ben-Ahmed, et al. [23] during the prospective study carried out on 120 patients who were hospitalized for a myocardial infarction between April 2011 and March 2012 in Morocco. Those two studies are probably not comparable regarding the method, the framework and the study target, however they enable us to note that the SAHOS has a high frequency when it is sought in persons having a cardiovascular history even though the diagnostic criteria used is the most objective possible.

Age and sex: The association of age and OSAHS was statistically significant (p=0.003) in our study and the prevalence increases with age as shown in all the studies. Indeed, the prevalence increases to reach a maximum of 34.7% after 50 years. Pépin and Tamisier [19]

showed that the prevalence of OSAHS increases with age to reach a plateau after 65 years with a maximum prevalence of 10% in the general population. The difference between those studies is that ours is among a population of workers where the maximum age of exercise is 60 years.

Gender: 67.1% of workers who had OSAHS were male compared to 32.9% of female workers. The association between sex and OSAHS was statistically significant (p = 0.02) in our study, which shows a high frequency in male subjects. This result is confirmed by the literature, so Young and Newman [24,25] show in their different studies that the SAHOS is more common in men than in women.

History of hypertension and alcohol consumption: 45.5% of workers with a history of hypertension had OSAHS compared to 20.8% who had no history of hypertension. The association between history of hypertension and OSAHS remained significant after multivariate analysis, so having a history of hypertension increased by 3.18 [1.51; 6.71] times the risk of presenting symptoms of OSAHS. Similarly, at the end of the multivariate analysis alcohol consumption remained significantly associated with symptom of OSAHS. For example, a worker who consumed a lot of alcohol was 5.44 [1.43; 20, 69] times more likely to present a symptom of OSAHS than the worker who did not consume alcohol at all.

Conclusion

The strengthening of health actions at work requires a better knowledge of the ailments suffered by workers. And it is in response to this requirement that the study on sleep disorders and their consequences on the performance of healthcare workers was initiated and carried out. Sleep disorders remain a pathology to which very little attention is paid in the health system and especially professionally in Benin. The present study, through the originality of its theme, brings the question to the surface in order to encourage the elaboration of appropriate national strategies of struggle in order to reduce the disadvantages on the economic fabric.

Acknowledgement

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