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Prevalence and Impact of Excessive Daytime Sleepiness Among Teachers

[1] Adjiri Djamila

[1] Clinical Physiology Laboratory, Ferhat Abbas University, Sétif 1, Algeria
[1] Laboratory of Biopharmaceuticals and Pharmacometrics. Ferhat Abbas University, Sétif 1, Algeria

Corresponding Author: **Adjiri Djamila**

Abstract

Aims: Excessive daytime sleepiness (EDS) is a public health problem today by its multifactorial etiology, it's unknown if not neglected aspects and especially its socio-family repercussions. This work aims are to estimate the EDS prevalence at teachers of the Faculty of Medicine of Setif - Algeria, to study its impact on daily life and attitudes towards this pathology.

Methods: It's a transversal type study carried out on 278 teachers, with EDS quantification by the Epworth sleepiness scale.

Results: The crude prevalence was estimated at 27.3%; (95% CI = 26.8% – 27.8%); 23.7%; (95% CI = 23.2% – 24.2%) for moderate EDS; and 3.6% (95% CI = 1.4% – 5.6%) for severe EDS. Its significantly less important for the dentistry department, but with twice increased risk for men and temporary teachers. Difficulties at work and the notion of accidents were the most frequently reported. The banal conception of pathology was observed in two thirds of the teachers. That of consultation was reported by one in 10 teachers.

Discussion: The prevalence and the repercussions observed remain compliant with the literature data and would be linked to the specificity of the population studied and the working conditions.

Conclusion: Proper management with clinical monitoring, questioning and investigations of etiological factors are strongly recommended.

Keywords: Excessive Daytime Sleepiness, Teachers, Faculty, Medicine, Setif

Introduction

Excessive Daytime Sleepiness (EDS) refers to increased sleep pressure during the day, which is manifested by an increased tendency to fall asleep and an irrepressible need for sleep that can go as far as incoercible "sleep fits" with involuntary drowsiness in inappropriate situations [1]. It can be physiological, when it occurs in the evening, under the influence of the homeostatic process of sleep or in the early hours of the afternoon under the influence of the semi-circadian rhythm of sleep; or pathological, excessive, when it occurs daily or almost, outside the aforementioned hours, and constitutes an embarrassment for the subject and society [2-4].

The causes of EDS are multiple and numerous [2, 5, 6] and remain very little known in the medical community [3]. In addition to age beyond 55 years [7], it can be induced by insufficient sleep or under the effect of drugs or substances including alcohol or tobacco [8]; as it can be of neurological, psychiatric, infectious, metabolic, endocrine or traumatic origin [2, 3, 5, 9-13].

EDS can be of behavioral origin, especially in young people vis-à-vis screens and social networks in the evening [14-16].

EDS generates a significant socio-professional handicap and drastically increases the risk of road or professional accidents [3, 17], the most spectacular and best-known consequence, the accidental risk of which is undeniable [18-20]; an alteration of cognitive functions with insufficient school results or diminished professional performance [21], causing social and family difficulties [2].

The incidence is very poorly known, it would be around 0.74 to 1.1% per year per 100,000 people. [5, 10]

At least 4-6% of the population suffer from EDS [1, 2, 6, 7, 9, 22]. 15 to 20% for the moderate form [2, 5] and 6 to 11% for the severe form [5, 9, 23]. This prevalence can go up to 20 to 30% in certain categories such as in the case of shift work [21, 24, 25], in depressed subjects (50.8%) [26], even within the general population [3, 27].

Excessive daytime sleepiness, previously neglected or even derided, is now a public health problem because of the risks it entails for the individual and for society. The positive diagnosis is often late, the affected subjects getting used to living with this drowsiness. The etiological diagnosis is fundamental for the prescription of an appropriate treatment [2].

Whatever the origin of drowsiness, there is always a way to improve the alertness of the patient. [3, 28-30], including virtual

agents which are a promising solution [31] or biomathematical models which are simple tools to predict the risk of sleepiness linked to atypical schedules and to adapt the schedules and configuration of the teams of emergency services [32].

The aim of our work is to estimate the prevalence of EDS at teachers of the Faculty of Medicine of Setif, to study its impact on daily life, and attitudes towards this pathology.

Materials and methods

It's a transversal study carried out on all teachers of the Faculty of Medicine of Sétif -Algeria, whose number is 278. EDS was quantified by the Epworth Sleepiness Scale (ESS) with scores greater than 10 for moderate EDS and 16 for severe EDS [4, 33].

The variables studied were:

- Individual characteristics (department of practice, age, sex, professional category and status).
- EDS
- Variables related to the impact of EDS (driving a vehicle, accident occurrence, work difficulties and impact on family and social life).
- Consultation and taking treatment.
- The statistical methods used were:
- Descriptive statistics techniques (tabular presentation and reduction parameters)
- Calculation of the prevalence with 95% confidence interval (95% CI) by approximation of the binomial law by the Laplace-Gauss law or by the binomial law [34, 35].
- Statistical comparison tests (chi-square and reduced-deviation test for comparing proportions, Student test for comparing means).
- Epidemiological association measures (Odds-Ratio with 95% CI by the exact method) [36].

Results

Individual characteristics of the study population

The distribution of the study population showed that more than half of the teachers worked in the department of medicine, that it includes two women for one man. The mean age was 38.9 years. Eight teachers out of 10 were hospital-university teachers and three-quarters teachers with permanent status (Table 1).

EDS

The Epworth Sleepiness Scale (ESS) was greater than 10 for 76 teachers, including 10 cases greater than 16. The mean score was 8.1 with a standard deviation of 3, 9. The crude prevalence was 27.3%; (95% CI = 26.8% – 27.8%) with 23.7%; (95% CI = 23.2% – 24.2%) for moderate EDS; and 3.6%; (95% CI = 1.4% – 5.6%) for severe EDS.

The prevalence of EDS is significantly lower for the dentistry department. The rate was 5.9% against 34.6% for the department of medicine; and 22.7% for the pharmacy department ($p < 1$ p.100). The respective mean ESS were 6.6 (2.6), 8.6 (4.3) and 7.8 (3.6) were also statistically different ($p < 5$ p.100). There was no statistically significant difference for age (less than 55 years old; and greater than or equal to 55 years old). Male sex and temporary teacher status are associated with twice the risk of EDS, with a statistically higher mean ESS ($p = 1$ p.1000) among temporary teachers (Table 2).

Repercussions and attitudes

Difficulties at work are the most frequently reported type of impact (42.1%). Driving a vehicle was reported by two thirds of the cases of EDS, the accident notion was reported by only one case out of 10, but with an increased risk 10 times greater for ESS greater than 16. The medical consultation was only observed in 10.5% cases. It is significantly 10 times more frequent when ESS was greater than 16. The reason for not consulting is the banal conception of the EDS (60.3%) (Table 3, Table 4).

Table 1: Individual characteristics of the study population (n = 278)

Caracteristic	Number	% / Mean (Standart-deviation)
Department		
Medicine	156	56,1
Pharmacy	88	31,7
Dentistry	34	12,2
Age (Years)	38,9 (10,6)	
< 55	238	84,9
≥ 55	42	15,1
Sex		
Female	172	61,9
Male	106	38,1
Professional category		
Hospital-University	224	80,6
University	54	19,4
Statut		
Permanent	210	75,5
Temporary worker	68	24,5

Table 2: EDS and individual Caracteristiscs (n = 278)

Caracteristic	ESS > 10	ESS Maen (Standart-deviation)	p	% (CI 95 %)	p	OR (CI 95 %)
Department						
Medicine (n = 156)	54	8,6 (4,3)	< 5 p.100	34,6 (27,6 – 41,6)	< 1 p.100	
Pharmacy (n = 88)	20	7,8 (3,6)		22,7 (13,7 – 31,7)		
Dentistry (n = 34)	2	6,6 (2,6)		5,9 (3,0 – 14,7)		
Age (Years)						
< 55 (n = 236)	64	8,2 (3,8)	DNS	27,1 (21,1 – 33,1)	DNS	
≥ 55 (n = 42)	12	7,5 (4,4)		28,6 (18,6 – 38,6)		
Sex						
Female (n = 172)	40	7,9 (3,6)	DNS	23,3 (17,3 – 29,3)	5 p.100	1,7 (1,0 – 2,9)
Male (n = 106)	36	8,4 (4,4)		34,0 (25,0 – 33,0)		
Professional category						
Hospital-university (n = 224)	62	8,3 (3,9)	< 5 p.100	27,2 (21,2 – 33,2)	DNS	
University (n = 54)	14	7,0 (3,8)		25,9 (13,9 – 37,9)		
Statut						
Permanent (n = 210)	50	7,6 (3,8)	1 p.1000	23,8 (17,8 – 29,8)	< 5 p.100	2,0 1,1 – 3,5)
Tomprary worker (n = 68)	26	9,4 (3,9)		38,2 (26,2 – 50,2)		

n: Number; ESS: Epworth Sleepiness Scale; p: Error Probability; CI: Confidence Interval; OR: Odds-ratio; DNS: Difference Not Significant

Table 3: EDS impact and attitudes (n = 76)

Caracteristic	ESS = 11 – 16 (n = 66)	ESS > 16 (n = 10)	Total	p	OR (CI 95 %)
Driving a vehicle	42 (63,6)	6 (60,0)	48 (63,2)	DNS	
Accident notion	4 (6,1)	4 (40,0)	8 (10,5)	< 1 p.100	10,3 (2,0 – 52,2)
Difficulties at work	28 (42,4)	4 (40,0)	32 (42,1)	DNS	
Impact on family and social life	20 (30,3)	6 (60,0)	26 (34,2)	DNS	
Medical consultation	4 (6,1)	4 (40,0)	8 (10,5)	< 1 p.100	10,3 (2,0 – 52,2)
Treatment intake	16 (24,2)	4 (40,0)	20 (26,3)	DNS	

n: Number; ESS: Epworth Sleepiness Scale; p: Error Probability; CI: Confidence Interval; OR: Odds-ratio; DNS: Difference Not Significant

Table 4: Not consulting reasons

Reasons	Number	Percentage
I do not have time	0	0,0
I think it's no big deal	32	60,3
I do not want	4	7,5
It does not require a consultation	5	9,4
I take care of myself	11	20,7
I don't know which doctor to consult	1	1,8

Discussion

The work that we present is one of the rare works that has focused on the sleep pathology in the region. It made it possible to estimate the prevalence of EDS in a category of the population. This estimate can be considered reliable due to the exhaustive nature of the study. The participation rate was 98.9%, with a non-response rate that we considered low, not requiring correction.

The choice of the ESS was based on the nature of the population studied, comprising subjects with a high intellectual level, who can easily answer the questionnaire and thus limit the risk of misunderstanding and subjectivity. This method remains one of the best known, best validated and most widely used instruments [1, 4]. Despite its subjective rating, its low sensitivity and specificity [37], it appears to be quite satisfactory, clinically relevant, and easy to use routinely [33].

The prevalence figures found, 27.3% for crude prevalence, 23.7% for moderate EDS; and 3.6% for severe EDS; can be considered congruent with literature data. The great variability in prevalence figures is partly explained by methodological differences and shortcomings [38]; such high figures have been reported even in the general population [3, 27], or for the shift work [21, 24, 25]. They could therefore be explained by the specificity of the study population, the work of a teacher requiring both physical and intellectual efforts with preparation outside working hours and often at night.

The lack of experience and the fact of teaching in consecutive sessions for part-time teachers could explain the increased risk of EDS observed for this category. The small numbers and the nature of the teaching, which is often practical in a dental chair, were probably linked to a low prevalence within the dentistry department.

The different forms of repercussions found with varying frequencies, in particular difficulties at work and the repercussions on family and social life, confirming that EDS, by the consequences it can have, does not only concern the affected subject but also his family and even the whole of society [2].

The risk of accident, especially for severe EDS, which remains undeniable [39, 40], with the lack of awareness even for affected subjects [2], must imperatively lead to screening, early diagnosis and correct management actions.

Awareness-raising actions are also essential, particularly of raising awareness of the importance of sleep for health [16, 41]. The EDS is not only a matter for specialists. Any doctor is concerned by the presence of a possible EDS in one of his patients [2].

Even if at the present time, we do not yet have measurement parameters allowing a reliable assessment of driving ability [1]; a variety of means to assess, subjectively and objectively, an EDS are available [2]. First, clinical monitoring: questioning about sleep and alertness disorders, looking for treatments or toxic substances affecting alertness and use of sleepiness scales (Epworth scale) or sleep diaries; surveys on working conditions with a precise description of the position and working hours, transport conditions, working environment and physical and mental workload [18] are still strongly recommended.

Conclusion

Excessive daytime sleepiness (EDS) is a public health problem today by its multifactorial etiology, it's unknown if not neglected aspects and especially its socio-family repercussions. This work aims are to estimate the EDS prevalence at teachers of the Faculty of Medicine of Setif - Algeria, to study its impact on daily life and attitudes towards this pathology.

Results shows that Proper management with clinical monitoring, questioning and investigations of etiological factors are strongly recommended.

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