



Prevalence and Associated Factors of Cephalalgias in a Professional Environment—Case of Teachers of Libreville

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Abstract

Objective: To determine the prevalence of headaches among Libreville teachers. **Introduction:** Headaches, commonly referred to as “headaches”, correspond to all the unpleasant sensations felt in the head. It is generally a question of subjective manifestations that only the patient can express. The most common functional sign is pain, which in itself is difficult to measure. **Methodology:** This is a cross-sectional prospective study with analytical and descriptive aims, which took place over a period of 4 months from February 1st to June 1st, 2016. It took place in five public secondary schools in two of the six districts of Libreville. Was considered cephalalgic (or suffering from headache), any teacher who answered “Yes” to the question: “Are you prone to headaches?” The choice of the reference interval to be able to evaluate the working time of the recruited teachers was inspired by the European standards which globally place the average weekly working time of teachers between 30 and 40 hours. The collected data were processed and analyzed with Epi-info 7 and SPSS 22 software. A regression analysis was performed to identify the associated factors. **Results:** We collected 236 teachers whose average age was 43.2 ± 7.9 years, with extremes of 27 and 60 years. There were 141 men (59.7%) and 95 women (40.3%) with a sex ratio of 0.96. The prevalence of headache was 76.7%. The factors associated with headaches were the subject taught, the number of students, and the provision of private tutoring. Five main triggers were found: overwork (86.2%), lack of sleep (84.5%), sun (73.5%), noise (68%) and fatigue (64.6%). The effects of headache were discomfort in daily activities (65.7%), absenteeism (35.9%) and a reduction in sleep time. **Conclusion:** Our study shows that headaches particularly affect

the teaching profession with female predominance due to stressful situations caused by their work environment.

Subject Areas

Public Health

Keywords

Headache, Teachers, Libreville

1. Introduction

Headaches, commonly known as “headaches”, correspond to all the unpleasant sensations felt in the head [1]. It is generally a question of subjective manifestations that only the patient can express. The most common functional sign is pain, which in itself is difficult to measure [2].

A global burden of disease study conducted in 2013 found that headache was the third leading cause of years of life lost due to disability [3].

In France, the average annual expenditure per patient is around 220 euros for all categories of expenditure combined and all cephalalgic categories combined [4].

In the United States, the annual direct medical costs of headaches are estimated at US \$1 billion [5]. A high rate of headache is sometimes found among teachers, but migraine is less common among managers and higher intellectual professions as well as among workers and clerks [6]. In fact, apart from living conditions and the workload of teachers, constant direct contact with learners is potentially a source of stress with somatic effects, including headaches [7].

The scarcity of epidemiological data on the subject in Gabon, as well as the peculiarity of the socio-psychological context of the teaching profession motivated this study to contribute to the progress of scientific research in our countries.

2. Methodology

This is a prospective, cross-sectional, descriptive, cross-sectional study that took place over a 4-month period from February 1 to June 1, 2016.

It was represented by all the teachers or trainees delivering courses in the institutions chosen for the 2015-2016 academic year.

Included in this study were teachers providing courses in selected institutions and those giving free and informed consent.

Not included in this study, those being absent on the day of the survey and teachers refusing to answer the questions of the investigators.

The subjects were selected by a two-stage random probing technique. At first, we selected 20 high schools among the establishments distributed among the 6

districts that account the city of Libreville. At these 20 establishments, we sent a request specifying the objectives and interests of the study, only 5 establishments had responded favorably. We then recruited the teachers who made up the framework who met the inclusion criteria.

Was considered cephalalgic (or suffering from headache), any teacher who answered “Yes” to the question: “Are you prone to headaches?”

The choice of the reference interval that we used to evaluate the working hours of the teachers we recruited was inspired by European standards which globally place the average weekly working time of teachers between 30 and 40 hours.

The collected data were processed and analyzed according to the software Epi-Info 7 and SPSS 22. The association between the independent variables and the dependent variable was estimated by thekhi-2 test (or Fischer’s exact test as appropriate). For these tests, a $p < 0.05$ was considered statistically significant and the confidence intervals were calculated at 95%.

The study of associated factors was made by the logistic regression model in uni-varied and multi-variate analysis. The multivariate analysis was done by introducing into the model all the variables whose “p” in univariate analysis was $\leq 20\%$.

3. Results

A total of 317 teachers were seen and examined. Of the 317 fact sheets completed, 81 were non-exploitable. The total number of teachers finally included in the analysis was 236. The level of coverage of the target is 74.4% compared to the teachers seen and examined.

3.1. Prevalence of Headaches

Of the 236 teachers included, 181 reported being prone to headaches, a prevalence of 76.7%. as shown in **Table 1**.

3.2. Sociodemographic Factors

There was a statistically significant relationship between the sex of teachers and the occurrence of headaches ($p = 0.000$). Women were 1.4 times more likely to have headaches than men with a sex ratio of 0.96. Headache cases were observed in all age groups, but those aged 35 - 44 were the most affected (83.9%) followed by 25 - 34 year olds (81%).

Table 1. Distribution of teachers included by onset of headache.

Modalities	Effective	Proportions (%)
Yes	181	76.7
No	44	18.6
Do not know	11	4.7
Total	236	100.0

Table 2 summarizes the socio-demographic factors associated with headaches.

3.3. Professional Factors

➤ Category and discipline

The discipline taught was significantly related to headache ($p = 0.047$). Those who taught literary disciplines had a high frequency of headaches (see **Table 3**).

➤ Workforce and weekly schedule

The average number of students in the classes ($p = 0.008$) and the number of hours of private lessons were associated with headaches (**Table 4**).

Table 2. Prevalence of headache by sociodemographic characteristics.

Variables	Total (N)	Headache		RP	IC _{95%} RP	p
		n	%			
Sex						0.000
Man	141	94	66.7	1		
Wife [†]	95	87	91.6	1.4	1.2 - 1.6	
Age (years)						0.095
25 - 34	42	34	81.0	1.2	0.9 - 1.4	
35 - 44	87	73	83.9	1.2	1.0 - 1.4	
45 - 54	84	58	69.0	1.0	0.8 - 1.2	
≥55 [†]	23	16	69.6	1		
Marital status*						0.579
Married [†]	138	104	75.4	1		
Concubinage	33	25	75.8	1.0	0.8 - 1.2	
Divorced	5	5	100.0	1.3	1.2 - 1.5	
Single	59	47	79.7	1.1	0.9 - 1.2	

*: Missing data, (N = 235), [†]: reference category.

Table 3. Prevalence of headache by category and discipline.

Variables	Total (N)	headaches		RP	IC _{95%} RP	P
		n	%			
Category						0.551
Public	233	179	76.8	1.2	0.5 - 2.6	
Private/Parapublic [†]	3	2	66.7	1		
Disciplined						0.047
Literary	132	108	81.8	1.3	0.8 - 1.6	
Scientist	61	39	63.9	0.9	0.6 - 1.3	
Artistic [†]	11	8	72.7	1		
Other*	32	26	81.3	1.1	0.7 - 1.7	

*: History-geography, economics, languages, sport, [†]: Reference category.

Table 4. Prevalence of headache by number of students and teachers' weekly schedule.

Variables	Total (N)	headaches		RP	IC _{95%} RP	P
		n	%			
Number of students						0.008
20 - 30	17	16	94.1	1.2	1.0 - 1.3	
31 - 50	86	57	66.3	0.8	0.7 - 1.0	
≥51 [†]	133	108	81.2	1		
Total working hour						0.324
<30	35	30	85.7	1.1	0.9 - 1.3	
30 - 40	46	33	71.7	0.9	0.8 - 1.1	
>40 [†]	155	118	76.1	1		
Teaching hours						0.230
<10	30	27	90.0	1.5	0.9 - 2.5	
11 - 15	57	6	78.9	1.3	0.8 - 2.2	
16 - 20	120	45	75.0	1.3	0.7 - 2.1	
21 - 25	19	90	68.4	1.1	0.6 - 2.1	
≥26 [†]	10	13	60.0	1		
Non-teaching hours						0.248
<20 [†]	62	49	79.0	1		
21 - 30	66	47	71.2	0.9	0.7 - 1.1	
31 - 40	38	26	68.4	0.8	0.7 - 1.1	
41 - 50	28	20	80.0	1.0	0.8 - 1.3	
>50	45	39	86.7	1.1	0.9 - 1.3	
Private lecture hours						0.012
Aucune	134	110	82.1	1		
1 - 4	42	26	61.9	0.7	0.6 - 0.9	
5 - 9	32	24	75.0	0.9	0.7 - 1.1	
10 - 14	18	16	88.9	1.1	0.9 - 1.3	
≥15	10	5	50.0	0.6	0.3 - 1.1	

[†]: Reference category.

4. Discussion

➤ Prevalence of headaches

Headache prevalence among public and general secondary school teachers in Libreville was 76.7%. On the continent, our result is three times higher than that reported by Adoukonou *et al.* in 2012 in Benin in a population of workers in Cotonou is 24.8% [8].

In France, our prevalence is a little closer to that found by Moisy in 2003, which reveals that almost one in two French people aged 15 years and over, said to suffer from headaches or a prevalence of 46.8% [9]. The differences observed with the above studies could be explained by the size of our sample, the sampling technique, the age groups taken into account and the characteristics of the target

population. Gaudin also reports in 1996 that in a professional environment, a high headache rate is sometimes found among primary school teachers, while ten years earlier, Otto had already revealed that headaches were among the health problems most reported by teachers. In Australia [6] [10]. In addition, an epidemiological survey conducted in France in 2000 on the General Mutual of National Education (MGEN) in comparison with that conducted by the research center for research and documentation in health economics (CREDES) in 1998 on the general population, found that teachers were three times more likely to suffer from sleep disturbances and twice as likely to have migraine and headache [11] [12] [13]. Therefore, these observations may explain our prevalence rate, which seems “record” but still comparable to that found by WHO worldwide, which estimates that between one-half and three-quarters of adults in 18 - 65 years would have had headaches in 2011 [3].

➤ **Sociodemographic factors**

• **Sex**

Of the 236 teachers included in our study; 181 had headaches, of which 94 men (66.7%) and 87 women (91.6%). There was a statistically significant relationship between teacher sex and headache ($p = 0.000$). Women were 1.4 times more likely to have headaches than men. This hierarchy is broadly in line with that found in the literature, even though our prevalence remains much higher than those found in the majority of studies such as Lipton, Bada and Moisy in the general population [5] [9] [14]. In addition to the theory of the involvement of hormonal factors in the genesis of headaches, psychological difficulties and gender-related behavioral differences may explain these differences [15]. In fact, the difficulty of reconciling family and professional life is more pronounced for women, influenced by the obligation to do domestic chores and/or the presence of infants in the household [16] [17].

• **Age**

In our study, there is no significant relationship between age and onset of headache ($p > 0.05$). All age groups are concerned, but we note an acme between 25 - 44 years where we have a prevalence of headaches exceeding 80%, past this age, this prevalence gradually decreases. This result is similar to that found by Moisy, which shows that it is the French of 30 - 44 years who are the most affected with a prevalence of 30% [9].

The discrepancies observed may be explained initially by the difference in sample size and the nature of the population, and then by the fact that young subjects do much more physical and intellectual effort compared to older subjects who have some experience.

➤ **Professional factors**

• **The discipline taught**

We observed in our study that the discipline taught was significantly related to headaches with a statistical test $p < 0.05$. Teachers in literary disciplines had a higher prevalence of headaches.

This can be explained by the fact that literary teachers have by far a greater number of students than those in other disciplines. In addition, there was a strong statistical association between student enrollment and headache. A larger number of students in a classroom requires more management and increases the risk of losing control, which adds to the workload reported by Messing *et al.* [18].

In addition, literary teachers spent more time teaching in class (38%), marking assessments (28%) and documentation (9.3%). This is broadly consistent with the data collected by Perronetin France, Ducrey *et al.* in Switzerland and Riel in Canada [17] [19] [20]. The differences observed are essentially due to the size of the samples, without forgetting that the content of the teachings dictated by the educational policies of each Ministry of National Education, differ from one country to another but also from one discipline to another [21].

Thus, if French teachers prefer the lecture with a greater influx of theoretical knowledge. Art teachers advocate individual help with a better expression of students' imagination and personality. It seems that this method allows teachers to offer more emotional support to their students in order to have better contact with them [17]. This explains why teachers in these disciplines are less subject to headaches, and leads us to think like Riel when she says that these subjects are vital for the school of adolescents by the psychic appeasement they provide.

➤ **Workforce and weekly timetable**

• **The number of students**

The number of students taught was significantly associated with the occurrence of headaches among the teachers included in our study. It emerged that 56.4% of teachers had more than 50 students, the median number was 55. The number of students is directly proportional to the workload of teachers. In fact, the more students a teacher has, the more workload increases. These figures are moderately higher than those of most middle-income countries as reported by Tsouck Ibounde E *et al.* on behalf of the World Bank [22], but they corroborate data from the surveys of the Ministry of National Education and UNESCO [18] [21] [23]. The differences can be attributed to the size of our sample and to the specific educational system in each country.

The plethoric numbers found in our study could be related to:

✓ **High demand for schooling**

Despite a literacy rate of around 90%, there is a strong demand for education disproportionate to the pace of new construction: 69 schools in 2007 to enroll 97058 students [24]. However, we note that multiform efforts are made. Lastly, the partnership signed between the Gabonese government and the French Development Agency (AFD) for the construction of some sixty establishments between Libreville and Port-Gentil and the expansion of some existing ones already [25].

✓ **A high repetition rate**

It results from the congestion of a system that does not evacuate sufficiently from above, because cohorts often mark the pace within each cycle [26]. In pri-

mary education, the repetition rate is 37%, the highest in the world, twice the African average. In secondary education, the repetition rate is only slightly reduced by 26% in the first cycle compared with 23% in the second cycle [24]. The institution Bretton Woods estimates that it takes an average of 17 years for a Gabonese student to validate his BEPC while 12 years should be enough to obtain it [24]. In an attempt to solve this problem, the government decided for the 2015-2016 school year to harmonize the coefficients assigned to the main subjects taught.

✓ **Teacher and classroom deficits**

There is a significant deficit of teaching staff, especially in science subjects (159 in mathematics, 68 in the physical sciences, and 61 in life and earth sciences during the 2007-2008 school year) [27]. In 2016, the Directorate of Secondary Education states that 5460 national and expatriate teachers (public and private sectors combined) taught courses in 19 subjects. More than half of them, 2805 were posted in the province of Estuaire, against 165 for the Ogooue Ivindo, the province least equipped with teachers [28]. In addition, there are shortcomings in terms of supervision, the obsolescence of equipment and the lack of integration of new information technologies. Although, in 2007, significant improvement efforts are to be noted [24], in 2016, the Ministry of National Education (MEN) reports a need for 1799 secondary school classrooms [28].

• **Private lecture hours**

Our investigation found that privately administered private tutoring for additional pay was a factor for headache exposure ($p = 0.012$). In fact, 43.2% of the included teachers give private lessons and the prevalence of headaches increases overall with the number of hours of private lessons given. However, nearly 90% of teachers who spend between 10 and 14 hours of these classes a week report being cephalalgic compared to only half of those who do so more than 15 hours. This discrepancy could be related to the regulatory workload of teachers. With an overall average weekly working time of 49.5 hours, teachers capable of teaching more than 15 hours may have fewer regular hours of work.

On the other hand, this not insignificant propensity to seek additional incomes is certainly due to the low *budget allocations* allocated to education. Indeed, although in 2009 the total resources allocated to education represented 13.4% of the national budget, it remains below the African average which is around 19%. Moreover, the details of this envelope show that the item relating to the payment of wages alone accounts for 72% of the budget against only 12% for social assistance [24].

➤ **Burnout**

It is also a factor often mentioned by the teachers of our study. It has been widely described in the literature sometimes under the Anglicism “burnout” in the writings of Cau-Bareille, Lelièvre and Riel [13] [16] [17]. Brunet defines it in three characteristics:

- The impression of having dried up one’s energy and no longer being able to relate to the relationship;

- A tendency to dehumanize the relationship, including depersonalized and negative representation of students, parents and colleagues. The relationship is conducted in a cold, distracted, even cynical way.
- A decrease in personal accomplishment that is experienced as a failure; the sense that goals are impossible to achieve, no matter what efforts are made since they will never get there [29].

These aspects were not all directly assessed in our study, but we were able to realize some.

facts in the field, especially since during our interviews with teachers, there were many testimonials corroborating these situations.

➤ **Triggers**

Our study showed that cephalalgic teachers had poor knowledge of situations that could trigger their pain. Indeed, while 37 (15.7%) felt that their headaches were most often triggered by one or more factors, only 3 (8.1%) were still able to identify them accurately. We can explain it by a trivialization of the phenomenon reinforced by an important self-medication providing a transitional well-being. The main triggers for the identified headaches were: overwork (86.2%), lack of sleep (84.5%), sun (73.5%), noise (68%), fatigue (64%), (6%) and stress (60.2%).

These different factors are also found in a classical way by other authors, but at varying frequencies. Our result is similar to that of Lemordant [30], who reports that fatigue was the concern of 100% of teachers in general education colleges, while 51% of men had sleep problems compared with 88% of women. And overwork involved 58% of women versus 52% of men. On the other hand, more recently, Lelièvre [13] will find proportions much lower than ours concerning the sleep disorders by comparing the teachers with the rest of the population: 12% of teachers are concerned against 4% of the men and 22% of the teachers against 7% of women. The observed differences are due to the methodology and sample size that are unique to each study. For teachers, we can relate the prevalence of these factors to the specific conditions in which they practice their profession.

➤ **Headache resonance**

In our study, headache forced 74 teachers (35.9%) to miss classes in the month prior to the survey and 54 (29.8%) reported a daily sleep of less than 5 hours. This result is superior to those found in most European studies identified by Stovner [31]. Gérardy *et al.* [32], Rasmussen *et al.* [33] and Boardman *et al.* [34] found absentee rates similar to but much lower than ours (respectively 12%, 14% and 15%). In contrast, Bada [14] found 33.4% sleep disorder in Bamako in a population with characteristics similar to ours, which is still close to our result. Differences in sample size, modes of data collection, and diversity of populations under study justify these disparities.

5. Conclusion

Headaches are a real public health problem for all individuals regardless of age.

Our study shows that they particularly affect the teaching profession with female predominance due to the stressful situations generated by their work environment. Hence, the need to consider “modifiable” triggers is to reduce or prevent future episodes. The mastery of the epidemiology of headaches among teachers would allow a better clinical and therapeutic approach to symptomatology and incidentally contribute to the improvement of the education system, indicator of development of a state.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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