Reported bruxism and stress experience in media personnel with or without irregular shift work

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A standardized questionnaire was mailed to all employees of the Finnish Broadcasting Company with irregular shift work ($n = 750$) and to an equal number of randomly selected controls with regular 8-hour daytime work. The aim was to analyze whether irregular shift work, workload in terms of weekly working hours, dissatisfaction with current workshift schedule, health-care use, age and gender were associated with self-reported bruxism and experienced stress. The response rates were 58.3% ($n = 874$, 53.7% men) overall, 82.3% ($n = 617$, 56.6% men) for irregular shift workers and 34.3% ($n = 257$, 46.7% men) for the regular daytime work group. Those with irregular shifts were more often dissatisfied with their current workshift schedule than those in daytime work (25.1% versus 5.1%, $P < 0.01$). Irregular shift work was significantly associated with more frequent stress ($P < 0.001$), but not with self-reported bruxism. Workers dissatisfied with their current schedule reported both bruxism ($P < 0.01$) and stress ($P < 0.001$) more often than those who felt satisfied. In multivariate analyses, frequent bruxism was significantly associated with dissatisfaction with current workshift schedule ($P < 0.05$), number of dental visits ($P < 0.05$), and visits to a physician ($P < 0.01$), and negatively associated with age ($P < 0.05$), while severe stress was significantly positively associated with number of visits to a physician ($P < 0.001$). It was concluded that dissatisfaction with one's workshift schedule and not merely irregular shift work may aggravate stress and bruxism. ☐ *Dissatisfaction; health care use; non-patient; tooth grinding*

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In clinical studies, the reported prevalence of bruxism varies greatly, between 6.5% and 88%, while the figures in epidemiologic studies are usually lower, about 6–8% (1–7). Bruxism is most common between 20 and 50 years and tends to decrease with age. It is also more common among the better educated, and among women, especially during their reproductive years. Stress has been increasingly considered as an initiating, predisposing and perpetuating factor for bruxism, although their explicit relationship remains unclear (8–11).

Stress experiences reportedly arise from multifactorial work and life issues (12, 13). In recent research investigating the scale and severity of occupational stress in the UK, approximately 20% of the random working sample reported very high or extremely high levels of stress at work (14). Perceived stress was related to potentially stressful working conditions. Females in full-time work reported higher levels of stress than males, and when age was examined it was found that those at either end of the working age range reported less stress than those in the 35–55 years age group.

Shift work appears to be associated with work-related problems, most of these connected with the human circadian rhythm (15, 16). Moreover, irregular shift work has been addressed as a cause of fatigue and decreased work performance, and may expose employees to work hazards (17, 18).

Recently, a clear-cut association was found between self-reported bruxism and stress experience among multi-professional media personnel (19). In another study derived from the same database, bruxism was also significantly associated with female gender and frequency of physician and dentist visits, but not with work duties (20). One-sixth of media personnel work non-standard schedules and irregular shifts (Morning-TV, 24-h news, broadcast monitoring, text-TV, etc.). The aim of the present study was to examine whether irregular shift work, workload (weekly working hours), dissatisfaction with current workshift schedule, health-care use, age and gender associate with self-reported bruxism and stress experience.

Materials and methods

A standardized questionnaire was mailed to all employees of the Finnish Broadcasting Company with irregular shift work ($n = 750$) and to an equal number of randomly selected controls in the same company with regular 8-h daytime work. The work duties of the media personnel

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included journalism, broadcasting, program production, technical support, and administration.

The questionnaire covered demographic items, employment details, general health experience, physical status, psychosomatic symptoms, psychosocial status, stress, work satisfaction and performance, and health-care use. In the present study, the data were categorized as follows: (a) demographic data: gender, age in years; weekly working hours; (b) bruxism: self-assessed frequency of tooth grinding (1 = never, 2 = seldom, 3 = sometimes, 4 = often, and 5 = continually); (c) stress (Occupational Stress Questionnaire) (21): level of perceived stress, measured as follows: 'Stress means the situation when a person feels tense, restless, nervous or anxious, or is unable to sleep because his/her mind is troubled all the time. Do you feel that kind of stress these days?' (1 = not at all, 2 = only a little, 3 = to some extent, 4 = rather much, and 5 = very much); (d) dissatisfaction with current workshift schedule (irregular shifts versus daytime work); (e) health-care use: number of visits to physician and dentist during the preceding year

Statistical methods

Student's *t* test and the Mann-Whitney U test were used to compare group means. The chi-squared test was used to study associations between categorical variables. Two logistic regression models were fitted to analyze the independent effects of the background variables on the probability of frequent bruxism (present often or continually) and having severe stress ('rather much' or 'very much'). Independent variables included in the multivariate models were: gender (male = 0, female = 1), irregular shift work (no = 0, yes = 1), perceived dissatisfaction with current workshift schedule (no = 0, yes = 1), self-reported weekly working hours, number of visits to physician and dentist during the preceding year, and age in years. The forced entry method was used, i.e. all selected independent variables were entered in a single step in the regression model.

Results

The overall response rate was 58.3% ($n = 874$, 53.7% men). The response rate in the irregular shift-work group was 82.3% ($n = 617$, 56.6% men) and in the regular daytime work group 34.3% ($n = 257$, 46.7% men). The mean age for males in shift work was 45.0 years (standard deviation (*s*) 10.6) and for females 42.6 years (*s* 10.7) ($P < 0.001$); the figures for daytime workers were 47.4 years (*s* 9.7) and 45.5 years (*s* 10.1) (NS), respectively. Those with irregular shifts were more often dissatisfied with their current workshift schedule than those in daytime work (25.1% versus 5.1%, $P < 0.01$). The length of a usual irregular shift-work week was 42.6 h (*s* 10.6) in males and 38.2 h (*s* 10.7) in females ($P < 0.01$), and for daytime work 40.1 (*s* 12.7) and 37.6 (*s* 8.1) hours (NS), respectively.

Table 1. Frequency distributions of perceived bruxism and stress according to workshift schedule ($n = 874$)

Bruxism			Stress***		
%	Irregular shifts	Day work	%	Irregular shifts	Day work
Never	53.6	60.2	Not at all	5.5	6.6
Seldom	21.8	17.8	Only a little	27.9	35.9
Sometimes	13.2	13.6	To some extent	42.3	36.3
Often	7.4	5.5	Rather much	17.9	16.4
Continually	4.0	3.0	Very much	6.4	4.7

χ^2 test for trend: *** $P < 0.001$.

Irregular shift work was significantly associated with more frequent stress ($P < 0.001$), but not with bruxism (Table 1). Those dissatisfied with their current workshift schedule more often reported both bruxism ($P < 0.01$) and stress ($P < 0.001$) than those who felt satisfied (Table 2). Frequent bruxism (present 'often' or 'continually') associated significantly with younger age ($P < 0.05$), while subjects in the 35–54 age group more often reported having severe stress ('rather much' or 'very much') than younger and older employees ($P < 0.05$) (Table 3).

According to logistic regression, the probability of frequent bruxism was significantly associated with dissatisfaction with current workshift schedule ($P < 0.05$), number of dental visits ($P < 0.05$), and visits to a physician ($P < 0.01$), and negatively associated with age ($P < 0.05$) (Table 4). Logistic regression also revealed that the probability of

Table 2. Frequency distributions of perceived bruxism and stress according to satisfaction with current workshift schedule ($n = 874$)

Bruxism**			Stress***		
%	Dissatisfied	Satisfied	%	Dissatisfied	Satisfied
Never	43.1	58.4	Not at all	1.2	7.0
Seldom	23.8	19.9	Only a little	20.4	32.6
Sometimes	16.3	12.6	To some extent	38.9	40.9
Often	11.3	5.8	Rather much	29.3	14.7
Continually	5.6	3.3	Very much	10.2	4.8

χ^2 test for trend: ** $P < 0.01$, *** $P < 0.001$.

Table 3. Percentages of self-reported frequent bruxism ('often' or 'continually') and severe stress experience ('rather much' or 'very much') by age groups ($n = 874$)

	Frequent bruxism*	Severe stress*
Age group		
<35	15.5	4.0
35–54	9.6	7.8
55≥	7.9	3.3

χ^2 test: * $P < 0.05$.

Table 4. Regression coefficients (B) of the studied independent variables and the probabilities of reporting frequent bruxism ('often' or 'continually') and severe stress ('rather much' or 'very much'). Figures for stress in italics ($n = 874$)

	B	s_x	*P*	OR	95% CI for OR
Age	−0.026	0.012	0.025	n.a.	n.a.
	0.006	*0.016*	*0.701*	*n.a.*	*n.a.*
Weekly working hours	−0.011	0.011	0.329	n.a.	n.a.
	0.011	*0.009*	*0.228*	*n.a.*	*n.a*
Visits to physician ≤12 months	0.061	0.023	0.008	1.10	1.02–1.11
	0.131	*0.027<*	*0.000*	*1.14*	*1.08–1.2*
Visits to dentist ≤12 months	0.264	0.048	0.020	1.12	1.02–1.23
	0.009	*0.075*	*0.910*	*1.01*	*0.87–1.17*
Female gender	0.264	0.245	0.280	1.30	0.80–2.11
	0.290	*0.337*	*0.389*	*1.34*	*0.69–2.59*
Irregular shift work	0.126	0.287	0.662	1.13	0.65–1.99
	−0.79	*0.381*	*0.835*	*0.92*	*0.44–1.95*
Dissatisfied with current workshift schedule	0.651	0.272	0.017	1.92	1.13–3.27
	0.637	*0.371*	*0.086*	*1.89*	*0.91–3.91*
Constant	−1.480	0.762			
	−4.592	*0.956*			

ORs and corresponding 95% confidence intervals were not calculated for one additional year of age or working hour.
s_x = standard error of the mean.

having severe stress was significantly associated with number of visits to a physician ($P < 0.001$) (Table 4).

Discussion

Our main finding was that dissatisfaction with the current workshift schedule, and not merely irregular shift work in itself, associated with both reported bruxism and stress experience. Stress was also significantly associated with the number of visits to a physician. Nevertheless, those with irregular shifts reported more stress and were more often dissatisfied with their current (uncomfortable?) workshift schedule than those in daytime work. The latter may also be seen as different participation rates in the groups.

In accordance with earlier reports (1–4, 14), we also found that those of younger age were more often frequent bruxers, and that those in the 35–54 years age group were more stressed than subjects at either end of the age range of the present study.

Similarly, the overall occurrence of bruxism was in line with previous findings (3), bearing in mind the problems involved in such comparisons. Using questionnaires may cause difficulties in defining the actual prevalence of bruxism: it may be even more common among populations than surveys indicate, but not registered as a behavior by individuals because of its potential subconscious nature. Moreover, reporting of bruxism may be influenced by negative affectivity, and individuals with subjective distress may be more likely to perceive, overreact to and complain about their sensations (22).

Many theories explaining the controversial character of bruxism have emerged over the years (3, 5, 8, 23–25). Two groups of proposed etiological factors can be distinguished: peripheral (morphological) and central (pathophysiological and psychological). At present, peripheral morphological factors, e.g. occlusal discrepancies, are considered to play a minor role, if any, in the etiology of bruxism, while central factors, such as disorders in the dopaminergic system and stress, are suggested to be more important in its regulation.

Stress, in turn, is known to be an initiating, predisposing and perpetuating factor for physical impairment, psychological symptoms and sleep disorders (13, 20, 26). Moreover, there is evidence that bruxism may signify a sleep disturbance which appears concomitantly with the transient arousal response (4, 27, 28).

The present findings may indicate that bruxism is a sign of dysfunction due to dissatisfaction with stressful working hours. Further, prolonged stress may disturb sleep and lead to enhanced psychological or physical impairment, seen here as significantly more frequent physician visits. Bruxism may also in part be an early sign of an overall increased stress experience and, as bruxing was associated with more frequent dental visits, dentists should be more alert to this symptom complex in treatment planning and in terms of other medical consultations.

However, research indicates that both organizational and personal factors can impact negatively on work performance (29). There is general consensus that stress problems are multidimensional, i.e. that factors such as coping, psychosocial support and organizational support are involved, along with the availability of effective and biopsychosocially oriented health care (30). These factors have been found important in terms of preventing stress problems becoming chronic and disabling, and of avoiding consequential costs on the individual as well as organizational level.

In summary, dissatisfaction with one's workshift schedule and not merely irregular shift work may aggravate stress and bruxism.

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