ORIGINAL ARTICLE

Musculoskeletal disorders and quality of life of dentists

Distúrbios osteomusculares em cirurgiões-dentistas e qualidade de vida

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ABSTRACT

BACKGROUND AND OBJECTIVES: Quality of life has always been a human concern, especially nowadays when job market requirements are exposing dentists to stressing situations and adverse conditions, thus favoring the installation of several labor-related diseases. This study aimed at evaluating labor-related musculoskeletal disorders, painful symptoms and their relation with quality of life and the use of preventive measures by dentists.

METHODS: Study population was made up of dentists of the private network (n=64). Two self-applicable questionnaires were used being one to measure quality of life World Health Organization Quality of Life-bref and the other for musculoskeletal disorders.

RESULTS: Pain was more prevalent on neck and cervical spine (49.2%), followed by lumbar region (40%). With regard to quality of life, physical domain had higher mean scores (76.5%) followed by social relations domain (74.9%).

CONCLUSION: The region with higher prevalence of pain was neck and cervical spine and professionals with pain were not so happy with their quality of life.

Keywords: Dentists, Musculoskeletal disorders, Occupational diseases, Quality of life.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A qualidade de vida sempre foi uma preocupação do homem, especialmente nos últimos tempos em que as exigências do mercado de trabalho vêm expondo o profissional de odontologia a situações estressantes e condições adversas, favorecendo a instalação de diversas doenças decorrentes das atividades laborais. O objetivo deste estudo foi avaliar a presença de distúrbios osteomusculares relacionados ao trabalho; sintomas dolorosos e sua relação com qualidade de vida e o emprego de medida preventiva entre cirurgiões-dentistas.

MÉTODOS: A população de estudo foi composta por cirurgiões-dentistas da rede privada (n=64); dois questionários autoaplicáveis foram empregados, sendo um para mensurar qualidade de vida, *World Health Organization Quality of Life*-bref e o outro para distúrbios osteomusculares.

RESULTADOS: A região mais acometida por dores foi a do pescoço e da coluna cervical (49,2%), seguida pela região lombar (40%). No que se relaciona à qualidade de vida, o domínio físico apresentou a média de escores mais altos (76,5%) seguido do domínio relações sociais (74,9%).

CONCLUSÃO: A região com maior prevalência de sintomas dolorosos foi a do pescoço e coluna cervical; profissionais com dores apresentaram menor satisfação com sua qualidade de vida.

Descritores: Distúrbios Osteomusculares, Doenças Ocupacionais, Qualidade de Vida, Odontólogos.

INTRODUCTION

According to the World Health Organization (WHO)[1], quality of life (QL) is defined as: "individual perception of your position in life, in the context of culture and value systems within you live, and with regard to your objectives, expectations, standards and concerns". It is a broad concept, encompassing physical health, psychological status, independence levels, social relationships, environmental characteristics and spiritual pattern[1-6].

Programs of Quality of Life in Work (QLW) and health promotion give individuals further resistance to stress, high emotional stability, motivation, working efficiency, improved self-image and relationships, resulting in fewer accidents, social security costs and absenteeism. These factors help organizations improving their image, increasing productivity and enhancing organizational environment[7].

Labor activity occupies a critical space in human lives, thus the importance of looking for QL at work aiming at helping and meeting needs, considering that the level of individuals' satisfaction and involvement with their activities generates increased productivity[7-9]. Working conditions directly interfere with individuals' social relationships and especially with their health status. Currently, men are exposed to constant stressing situations related to labor activities, favoring the manifestation of several diseases, called occupational diseases[10].

Work related musculoskeletal disorders (WRMD) are in evidence and are considered the most frequent occupational disease[11]. As from the Industrial Revolution, occupational diseases started to be diagnosed by Social Security (SS) and recognized by workers and unions, because until then they

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were considered idiopathic affections[12]. In Brazil, the first terminology adopted by SS to define this group of musculoskeletal disorders was "tenosynovitis of the typist"; in 1992 they started to be called repetitive strain injuries (RSI) and this term was afterward replace by WRMD, or Work Related Musculoskeletal Disorders, following the world trend of unifying studies about musculoskeletal affections in a single term, eliminating the false idea that this clinical presentation only affects workers performing repetitive movements[11-13].

Such disorders represent a set of syndromes affecting muscles, muscle fascias, vessels, tendons, ligaments, nerves and joints, and may affect any region of the locomotor system, although being more frequent in cervical and lumbar regions and upper limbs (UULL)[6,13,14]. For performing constant movements with UULL, especially hands, using vibratory tools needing strong grip, dentists are highly subject to develop diseases such as Carpal tunnel syndrome, trigger finger and De Quervain syndrome, which cause inflammations which may limit movements thus impairing the practice of the profession[15].

The technical standard of the National Social Security Institute (INSS) (Service Order/INSS 606/1998) defines WRMD as a clinical syndrome characterized by work-related chronic pain followed or not by objective changes, especially manifested in the neck, shoulder girdle and/or UULL, which may affect tendons, muscles and peripheral nerves[16]. Most WRMDs are associated to biomechanical, psychosocial and administrative factors. Biomechanical factors are related to repetitive and manual movements using strength, inadequate posture and static overload; psychosocial factors are those related to strong pressure to obtain results, monotonous work and lack of interaction among colleagues; administrative factors are those related to excessive working hours, lack of necessary pauses and lack of health promotion and prevention[17].

WRMD signs and symptoms may vary according to each individual, being some of them common to all people. The first symptom is pain, which in the beginning is mild and associated to movement and becomes severe and continuous along time. In addition to pain, there are also sensation of weight and tiredness in the affected limb, tingling, numbness, crackling, circulatory disorders, edema, localized heat, fatigue, decreased strength, cramps, muscle atrophy and psychological disorders such as insomnia, depression and anxiey[11].

There are currently few professional categories which do not offer risk of developing some type of occupational disease, however some professions have a higher trend, such as: bank clerks, factory and industry workers and dentists, among others[18].

Dentistry is considered a profession often associated to occupational diseases[17], with a direct relationship between high indices of stress and physical pain and irregular ergonomic aspects, which are expressed by inadequate postures, physical and mental tiredness, as well as pathological conditions such as WRMD and stress-related diseases[19].

METHODS

This is a cross-sectional, quantitative and analytical study. For sample calculation, estimated prevalence of 93% was adopted according to previous study[17], tolerable error of 5% and confidence level of 95%. So, sample was made up of 59 dentists. To this number, 10% were added for possible losses and refusals.

Studied population was made up of dentists (n=64) acting in the private sector in cities of the state of São Paulo. Dentists not accepting to participate in the study and those who were not found in their offices after three attempts were excluded (n=76).

Research tools were two self-applicable questionnaires which were answered by professionals in their respective working environments. One of the was the Nordic questionnaire for the analysis of musculoskeletal symptoms (NQMS)[20] in its validated version for the Brazilian population[21], which has allowed to check the frequency and region of pain in a period of 12 months of work.

This tool is made up of 9 questions, being each one equivalent to a body region and illustrated by a human figure: neck/cervical region; shoulders; arms; elbows; forearms; wrists/hands/fingers; dorsal region; lumbar region; hip/lower limbs (LLLL). These questions have a scale from zero to 3 where: zero – no; 1 – seldom; 2 – often; 3 – always. The other tool, the World Health Organization Quality of Life (WHOQOL-bref) (WHO)[22] explores QL self-report. Its abbreviated version validated for the Brazilian population[23] is made up of 26 questions regarding the last 15 days previous to the evaluation. First two questions are general questions, being the first a reference to individual QL perception and the second about satisfaction with health. Remaining questions, in a total of 24, are distributed in four domains: physical, psychological, social relations and environment. WHOQOL does not provide for the use of global QL score being then calculated the score for each domain. The score for each domain is obtained in a positive scale from zero to 100, that is, the higher the score the better the QL in that domain.

Answers are represented in a Likert-type scale for: intensity, capacity, frequency and evaluation. Intensity is classified in: nothing, very little, more or less, a lot and extremely. Capacity is classified in: nothing, very little, more or less, a lot and extremely. Capacity is classified in: nothing, very little, medium, a lot and totally. Frequency is classified as: never, sometimes, often, very often and always. Evaluation is classified in: very bad, bad, not bad or good, good and very good; very happy, unhappy, not happy nor unhappy, happy and very happy.

Domains:

1) Physical: individuals' perception of their physical condition. It has the facets: pain and discomfort; energy and fatigue; sleep and rest; daily life activities; drug or treatment dependence and working capacity;

2) Psychological: individuals' perception of their affective and cognitive condition and the facets are positive feelings; think, learn, memory and concentration; self-esteem; body image and appearance; negative feelings and spirituality/religions/personal beliefs;

3) Social relations: individuals' perception of social relations and social roles adopted in life, with the following facets: personal relations; social support and sexual activity;
4) Environment: individuals' perception of aspects related to the environment where they live. Facets are: physical safety and protection; home environment; financial resources; health and social care: availability and quality; opportunities to acquire new information and skills; participation, recreation/leisure opportunities; physical environment (pollution/noise/traffic/weather) and transportation.
All health professionals agreeing to participate in the study have signed the Free and Informed Consent Term (FICT).

Statistical analysis
Data were stored and processed with the BioEstat version 5.3 and Epi Info 7 software. For descriptive analysis of all variables and bivariate analyses Mann-Whitney test was applied with significance level of 5%.

Table 1. Sample distribution according to demographic variables

Variables	n	%
Gender		
Female	38	59.4
Male	26	40.6
Age group (years)		
Up to 30	11	17.2
31 to 50	36	56.2
Above 50	17	26.6
Time working as professionals (years)		
1 to 16	27	42.2
17 to 27	22	34.4
28 to 35	15	23.4
Working hours (hours/day)		
6	9	14.1
8	20	31.2
More than 8	35	54.7
Practice of physical exercise (2 or more times/ week)		
Yes	32	50.0
No	29	45.3

The project was approved by the Research Ethics Committee, CAAE 35843614.5.0000.5420, Consubstantiate Opinion 875.562/2014 and complied with ethical principles according to the Declaration of Helsinki of the World Medical Association.

RESULTS

With regard to respondents' distribution, there has been predominance of females (59.4%). Most dentists (54.7%) worked more than 8 hours a day. When asked about physical activities, 50% have stated practicing physical exercises at least twice a week (Table 1).
Table 2 presents results of frequency of self-referred pain by body region. Most prevalent region was neck and cervical spine, being that from 64 participants, 49.2% have reported pain in this region, followed by lumbar region with 40%; elbows had the lowest prevalence of pain (4.6%) (Figure 1).
Table 3 shows results of self-referred pain frequency by body region. Region with the highest prevalence of painful symptoms was neck and cervical spine, being that from 64 participants, 49.2% have reported pain in this region, followed by lumbar region with 40%; elbows had the lowest prevalence of pain (4.6%).

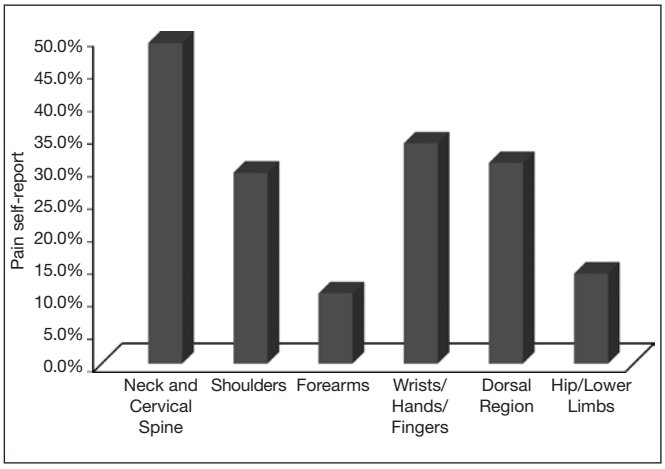

Figure 1. Distribution of pain self-report by body region

Table 2. Distribution of professionals according to pain self-report and body region of dentists

Body region	Frequency							
	Never		Seldom		Often		Always	
	n	%	n	%	n	%	n	%
Neck and cervical spine	15	23.1	17	26.2	27	41.5	5	7.7
Shoulders	26	40	19	29.2	15	23.1	4	6.2
Forearms	44	67.7	13	20	7	10.8	0	0
Wrists/hands/fingers	24	36.9	17	26.2	16	24.6	6	9.2
Dorsal region	15	30.8	23	36.9	21	26.2	5	4.6
Hip/lower limbs	44	67.7	11	17	8	12.3	1	1.5

Table 3. Central trend and dispersion of scores of WHOQOL-bref domains among dentists

Domains	Mean		Standard deviation		Coefficient variation		Minimum value		Maximum value		Amplitude		p value
	Pain	No pain	Pain	No pain	Pain	No pain	Pain	No pain	Pain	No pain	Pain	No pain	
Physical	15.75	17.50	2.57	1.35	16.29	7.72	10.29	15.43	20.00	20.00	9.71	4.57	0.0112*
Psychological	15.51	16.54	2.44	1.56	15.73	9.45	8.67	12.67	19.33	18.67	10.67	6.00	0.1429
Social relations	15.69	16.75	2.74	2.01	17.46	11.97	8.00	13.33	20.00	20.00	12.00	6.67	0.1981
environment	14.75	15.75	2.00	1.62	13.58	10.30	9.00	14.00	18.00	18.50	9.00	4.50	0.0897
Quality of life self-evaluation	14.71	17.00	3.16	1.63	21.45	9.61	8.00	14.00	20.00	20.00	12.00	6.00	0.0061*
Total	15.30	16.62	2.04	1.26	13.33	7.58	9.85	14.77	18.77	18.46	8.92	3.69	0.0438*

Mann-Whitney test. * statistically significant difference.

Table 4. WHOQOL-bref score parameters according to domains and painful symptoms

Variables	Mean	Median	Standard Deviation	Minimum	Maximum
Physical domain	76.5	64.3	15.3	35.7	100
Psychological domain	73.8	66.7	13.9	29.2	95.8
Social domain	74.9	58.3	16.2	25	100
Environment domain	68.3	53.1	12.3	31.3	87.5
Quality of life self-evaluation	73.4	55.2	12.5	32.6	93.8

Professionals with and without pain were compared with regard to WHOQOL-bref score domains. In all domains, professionals without pain had in average higher scores (17.00) as compared to those with pain, that is, from all domains, professionals without pain had higher scores (16.62) as compared to those with pain (15.30). With regard to Mann-Whitney test, those with statistical significant difference were: physical domain (p=0.0112), QL self-evaluation (p=0.0061) and the sum of all domains (p=0.0438) as shown in table 4.

DISCUSSION

Musculoskeletal pain and discomfort affect 62% of general population and the proportion increases to 93% among dentists[17]; this professional category is among those with more professionals on medical leave due to temporary or permanent incapacity, being responsible for approximately 30% of early profession abandonment[17]. Dentists are vulnerable to musculoskeletal disorders for frequently performing repetitive and precise movements, adopting inadequate postures due to surgical technique needs, excessive strengths and long working hours[2,24-31].

The Ministry of Health[32] points that females, regardless of profession, are more prone to develop WRMD as compared to males for still unknown reasons. So studies with homogeneous samples are needed to prove this prevalence[32]. Some authors advocate a biomedical indication referring to the fact that musculoskeletal development is different in females, who have a smaller number of muscle fibers as compared to males, as well as lower capacity to store and convert glycogen into useful energy[33].

With regard to working hours, this study has observed that participant dentists have reported working more than eight hours per day (54.7%), exposing professionals for a long time to factors noxious to health, such as adopting the same posture without pausing, manual strength and continuous repetitive and vibratory movements[7]. Long working hours and inadequate conditions are part, respectively, of administrative and mechanical factors causing WRMD. They influence QLe, in addition to generating professional dissatisfaction due to lack of time available for leisure[8].

Dentists, for acting in a restrict surgical field, adopt usual posture of head and neck flexion, followed by rotation and with shoulders bent forward, in the attempt to get a better visual field. This circumstance leads to cervical intervertebral discs compression and may cause dehydration in the long term, in addition to generating posterior neck muscles shortening, while medium and lower trapezium fibers may be elongated[33,34].

The higher frequency of neck and cervical spine pain has been already reported by national and international studies, as well as by our study[18,26,33,34]. Most common neck WRMD is cervicobrachialgia, which may be caused by muscle fatigue, repetitive movements and incorrect postures[28].

Environment had the lowest score among domains. These results were similar to other studies using WHOQOL-bref to evaluate QL of dentists[5,6].

Working environment is extremely important for professional satisfaction. When healthy in terms of physical, financial and social safety, it becomes source of support for professionals, however, very often, the environment is inadequate and becomes a source of stress[7].

Observed pain complaints were consistent with levels of satisfaction in the physical domain, that is, pain interferes with routine activities and working capacity and even with QL.

These results are in line with the group of WHOQOL developers who, in the physical domain, associate pain to worse QL[7]. In addition to physical domain, pain had significant relationship with total domains, proving its strong influence on QL in general. Dentists with pain were less happy with their QL[7,35]. Some preventive measures should be adopted by dentists to decrease the level of stress, prevent the frequency of painful symptoms and afterward WRMD diagnosis. One alternative is labor gymnastic, including stretching, massage, physical and psychological relaxation and physiotherapy. A broad ergonomic reform is needed in dentistry so that dentists adopt and use ergonomically correct postures in their daily professional activities[21].

CONCLUSION

Most frequent pain among dentists was in neck and cervical spine. Environment domain had the lowest WHOQOL-bref score mean. Dentists with pain were less happy with their QL.

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