Impact of health on quality of life and quality of working life of university teachers from different areas of knowledge

Hugo Machado Sanchez (https://orcid.org/0000-0001-5389-9783) [1]

Eliane Gouveia de Morais Sanchez (http://orcid.org/0000-0003-1291-7652) [1]

Maria Alves Barbosa (http://orcid.org/0000-0002-0861-9655) [2]

Ednaldo Carvalho Guimarães (http://orcid.org/0000-0001-8328-9687) [3]

Celmo Celeno Porto (http://orcid.org/0000-0001-5860-9490) [2]

Abstract *This study aimed to determine the impact of health on the quality of life (QoL) and quality of working life (QWL) of university teachers. A cross-sectional study was conducted with 284 teachers in the areas of health, sciences, human sciences, and agricultural sciences using a sociodemographic questionnaire containing health-related questions, the WHOQOL-bref, and TQWL-42. Results: the findings showed that teachers who practiced physical activity had better QoL, QWL, and sleep quality. Advanced age was also associated with better QoL. Furthermore, QoL and QWL were lower in teachers who used medications, had an imbalanced diet, and did not practice leisure activities. QoL and QWL are influenced by health-related factors.*

Key words *Quality of life, Work, Illness, Teachers*

[1] Curso de Fisioterapia, Universidade Federal de Goiás (UFGO). Rodovia BR-364, Setor Francisco Antônio. 75801-615 Jataí GO Brasil. hmsfisio@yahoo.com.br
[2] Faculdade de Medicina, UFGO. Goiânia GO Brasil.
[3] Faculdade de Matemática, Universidade Federal de Uberlândia. Uberlândia MG Brasil.

Introduction

Teaching is a profession characterized by constant mental and emotional strain, which can ultimately pose a health risk for teachers[1,2]. Working in environments with adverse working conditions and no prospects for professional growth and advancement, coupled with personal problems, is a growing concern among teachers, given that they are prime candidates for stress-related and other illnesses[3].

Various factors make university teachers prone to psychoemotional or psychosomatic illnesses: increasing scientific output demands; the constant need to keep their knowledge up to date through participation in congresses and panels; long working hours, including weekends and public holidays; lack of adequate facilities and working conditions; and technology stress (characterized by the body's psychological and physical response to the inevitable need to adapt to important technological innovations). Thus, the demands and work overload imposed on teachers extend beyond the need to stay up to date with science, generating feelings of guilt and helplessness when teachers are unable to meet the information demands placed on them[2,4].

The worsening of teachers' working terms and conditions began in the 1990s within the context of globalization and neoliberal reforms including the introduction of policies that blurred the boundaries between public and private. Against this backdrop, Brazilian workers experienced an intensification of privatization, overexploitation, and the weakening of union powers[5]. This problem was exacerbated in the 2000s with the introduction of contracts with limited employment protection, including temporary and permanent contracts without career development plans where salary is based on the number of hours spent teaching. Furthermore, the use of research grants and financial support for extension activities to pay teachers for hours spent teaching, reducing the time devoted to research and extension actives, has become common practice[6].

Moreover, the stimulation of internal competition between employees has become institutionalized. As result, teachers turn against each other, deepening individualism and neutralizing collective mobilization. An increasingly evident example of this in universities is the dispute between professionals, rather than departments, over every last bit of financial support provided by research funding agencies. In addition to internal competition, the government introduced

a university ranking system to help students choose "the best" university and control the quality of higher education. This situation increases the pressure placed on teachers and promotes an increase in the use of medication and illness[5].

Given the level of responsibility and demands faced by teachers, some higher education institutions provide training to promote reflective, critical, and competent teaching and help teachers make their lessons more interactive in order to stimulate student learning. However, this requires willingness on the part of teachers, and those who are unwilling to adapt and undergo training can experience difficulties in carrying out their functions, which increases the demands placed on these teachers inside and outside the workplace environment, often affecting their well-being in both environments[7].

Teachers' health, which is threefold in nature (biological, psychological and social), interdependent and contradictory, is also shaped by work, meaning that work can engender varying possibilities of consumption, satisfaction, illness, and death. Thus, work may be taken as an opportunity to reaffirm self-worth, develop skills, and express emotions, in turn making it an opportunity to build personal history and social identity. However, the work environment can also cause occupational illnesses, affecting the physical and mental health of teachers[8].

A study conducted by Delcor et al.[9] showed that 32.5% of teachers reported health problems. The same study found that the most common physical problems were back pain, leg pain, and vocal problems, while the most common psycho-emotional disorders were nervousness/anxiety and mental exhaustion. Lima and Lima-Filho[8] point out that, despite increased susceptibility to health problems among university teachers, little attention is paid to this problem by the government and higher education institutions, culminating in growing physical, emotional, and interpersonal malaise among teachers.

Another factor that plays a role in health is quality of life (QoL). QoL encompasses various aspects, including the view that there is an intrinsic relationship between working conditions and health, converging with classical perspectives within the field of social medicine and a discussion that has been revived in recent years whose core strategy is the concept of health promotion. This concept considers that the underlying determinants of health are lifestyle, advances in human biology, the physical and social environment, and health services[10,11].

Since it both influences and is influenced by health, viewed in the broader sense, QoL encompasses our fundamental human needs, which are both material and spiritual. As such, the main focus of QoL is health promotion, where it should be stressed that living without illness or overcoming the difficulties posed by morbidities directly influence QoL[11].

In view of the above, the objective of the present study was to examine the impact of health on QoL and quality of working life (QWL) among university teachers in the areas of health, sciences, human sciences, and agricultural sciences.

Method

A cross-sectional study was conducted with teachers from a public higher education institution (HEI) located in the Center-West Region of Brazil. The study was conducted in accordance with the ethical norms and standards for research involving human subjects and approved by the HEI's research ethics committee. All volunteers signed an informed consent form.

The academic staff of the HEI was made up of 386 teachers, which was the number used to calculate the representative sample size using OpenEpi® and adopting a confidence level of 95%, resulting in a minimum sample of 193 teachers. Representative sample sizes were also calculated for area of knowledge and sex. All areas of knowledge were assessed to provide a general picture of aspects of health, QoL and QWL in the population. Teachers with more than six months of university teaching experience were included, regardless of type of contract. The following exclusion criteria were adopted: incomplete questionnaires, teachers with disabilities, teachers carrying out an exclusively administrative function or on leave, and student teachers from post-graduate programs undergoing placements (Table 1).

Data was collected in all the courses provided by the HEI using the following three instruments: a sociodemographic questionnaire including health-related questions; the Total Quality of Work Life (TQWL-42), a specific instrument for measuring QWL; and the WHOQOL-Bref, a generic QoL questionnaire developed by the World Health Organization (WHO).

The first instrument comprised a structured questionnaire designed by the authors to collect nominal data on health-related sociodemographic characteristics. The questionnaire

was refined by three judges who were researchers from the area in question or experts on the proposed method. After refinement, corrections were made and two pre-tests were performed, resulting in further modifications to produce the final version used in this study.

The TQWL-42 was developed and validated by Pedroso et al.[12] for use with different populations. Based on widely used measures of QWL found in the literature and the WHOQOL-100, the TQWL-42 consists of 42 Likert questions divided into five spheres: Sphere 1 - Biological/Physiological; Sphere 2 - Psychological/Behavioral; Sphere 3 -Sociological/Relational; Sphere 4 - Economic/Political; and Sphere 5 -Environmental/Organizational.

The WHOQOL-Bref, developed by the WHO in 1998 and validated for use in Brazil by Fleck et al.[13], consists of 26 Likert questions divided into the following four domains: Domain 1 -physical; Domain 2 -psychological; Domain 3 -social relationships; and Domain 4 -environment.

The questionnaires were self-administered; however, when doubts arose, the researchers were on hand to assist respondents.

The reliability of the two QoL instruments was tested using Cronbach's Alfa, resulting in the following values: $\alpha = 0.80$ for the TQWL-42 and $= 0.85$ for the WHOQOL-Bref.

For the purposes of statistical analysis, incomplete questionnaires were excluded. Where one instrument was discarded, the other questionnaires filled out by the same respondent were also discarded.

The data was entered into an Excel worksheet (Microsoft Office Excel® 2010) and descriptive analysis was performed using the statistical software package SPSS®version 22.0. The Shapiro-Wilk test was then performed to test for normal distribution, followed by a comparison of QoL and QWL using the Mann-Whitney U Test

Table 1. Study sample (N = 284).

Area of knowledge	Teachers	Responded questionnaires
Biological sciences and health	158	113
Agricultural and land sciences	55	38
Sciences	61	51
Human sciences	112	82
Total	386	284

and the Kruskal-Wallis test when the comparison showed three or more groups. Spearman's correlation coefficient was used to test for associations between quantitative sociodemographic variables and the TQWL-42 and WHOQOL-Bref scores. A significance level of 5% was adopted (p < 0.05).

Results

A total of 11 incomplete questionnaires and 29 teachers were excluded in accordance with the exclusion criteria, resulting in a final study sample of 284 teachers distributed as follows: health–113; human sciences– 82; sciences– 51; and agricultural sciences– 38.

Figure 1 shows the correlation between age and QoL based on Spearman's correlation coefficient, demonstrating a weak significant association between the variables (r = 0.119 and p = 0.045).

Table 2 shows the sociodemographic data by area of knowledge. The sciences and agricultural sciences were predominantly male, while the areas as a whole were composed predominantly of married teachers. With respect to age, most of the teachers in the area of health and sciences were aged between 31 and 40 years and 20 and 30 years, respectively. In contrast, the majority of teachers in the area of agricultural were aged over 51 years.

The data on health-related variables (Table 3) show that most of the teachers had not been diagnosed with an illness, with the group in the area of agricultural sciences showing the highest percentage of teachers with an illness. With respect to smoking and drinking, the majority of teachers were non-smokers and occasional drinkers. The majority of teachers practiced leisure activities once or twice a week. In relation to physical activity, having a sedentary lifestyle and occasional low intensity were the most reported options. The majority of teachers reported good or moderate sleep quality.

The comparison of QoL and QWL across the categories of health-related variables revealed some significant differences. The QoL score of teachers who had taken sick leave (QoL = 14.56 ± 1.71) was lower (p = 0.023) than those who had never taken sick leave (QoL = 15.29 ± 1.74). Likewise, teachers who used medications (QoL = 14.87 ± 1.76) obtained lower QoL scores (p = 0.034) than those who did not use medications (QoL = 15.35 ± 1.72). With regard to leisure, the

findings show that teachers who practiced leisure activities once to twice a week (QoL = 15.55 ± 1.77) or twice to three times a week (QoL = 16.02 ± 1.65) showed higher QoL (p = 0.001) scores than those who did not practice leisure activities (QoL = 15.09 ± 1.77) (Table 3).

Physical activity was shown to influence both QoL and QWL. Sedentary teachers obtained lower QoL (QoL = 14.65 ± 1.75) and QWL (QWL = 3.54 ± 0.39) scores (p = 0.006 for QoL and p = 0.003 for QWL) than those who practiced regular moderate-intensity physical activity (QoL = 15.38 ± 1.62 and QWL = 3.27 ± 0.42). Sleep quality was also shown to influence QoL and QWL. Teachers who slept very well (QoL = 15.85 ± 1.74 and QWL = 3.53 ± 0.48) obtained higher QoL and QWL scores (p = 0.000 for QoL and p = 0.000 for QWL) than those who reported sleeping moderately well (QoL = 14.64 ± 1.5 and QWL = 3.33 ± 0.37) or badly (QoL = 13.67 ± 1.81 and QWL = 3.22 ± 0.43), while those who slept well (QoL = 15.75 ± 1.50) showed higher QoL scores (p = 0.000) than those who slept moderately well and badly (Table 3).

Diet also influenced QoL, with teachers with a balanced diet (QoL = 15.5 ± 1.58) showing higher QoL scores (p = 0.000) than those with an imbalanced diet (QoL = 14.71 ± 1.48), irrespective of type of imbalance (Table3).

The comparison between variables across areas of knowledge showed that non-smokers in the area of human sciences (QWL = 3.45 ± 0.39) and health (QWL = 3.42 ± 0.47) obtained higher QWL scores (p = 0.012 in both areas) than occasional smokers (QWL = 3.04 ± 0.16, health and QWL = 3.01 ± 1.38,human sciences). Teachers in the area of health who slept very well (QoL = 15.97 ± 1.57 and QWL = 3.55 ± 0.47) or well (QoL = 15.85 ± 1.61 and QWL = 3.55 ± 0.45) and those in the area of human sciences who slept well (QoL = 15.83 ± 1.41) also showed higher QoL and/or QWL scores (p = 0.000 for QoL and QWL, health and p = 0.002 for QoL, human sciences) than those who slept moderately well (QoL = 14.58 ± 1.44,QWL = 3.25 ± 0.20, health and QoL = 14.50 ± 1.33, human sciences) or badly (QoL = 12.92 ± 1.80,QWL = 3.20 ± 0.53, health and QoL = 14.21 ± 1.71,human sciences). With respect to leisure, the findings show that teachers in the area of health who practiced leisure activities once to twice a week (QoL = 15.25 ± 1.84 and QWL = 3.45 ± 0.49) or two to three times a week (QoL = 16.12 ± 1.71 and QWL = 3.56 ± 0.36) showed higher QoL (p = 0.005) and QWL (p = 0.008) scores than those who did not

practice leisure activities (QoL = 14.24 ± 1.68 and QWL = 3.18 ± .040).

With respect to physical activity, the results showed that teachers in the area of health who regularly practiced moderate-intensity activity (QoL = 16.41 ± 1.35 and QWL = 3.61 ± 0.40) showed higher QoL and QWL scores (p = 0.008 and p = 0.04, respectively) than those who were sedentary (QoL = 14.66 ± 1.97 and QWL = 3.24 ± 0.49), those who occasionally practiced low-intensity physical activity (QoL = 14.73 ± 1.98 and QWL = 3.36 ± 0.51), those who occasionally
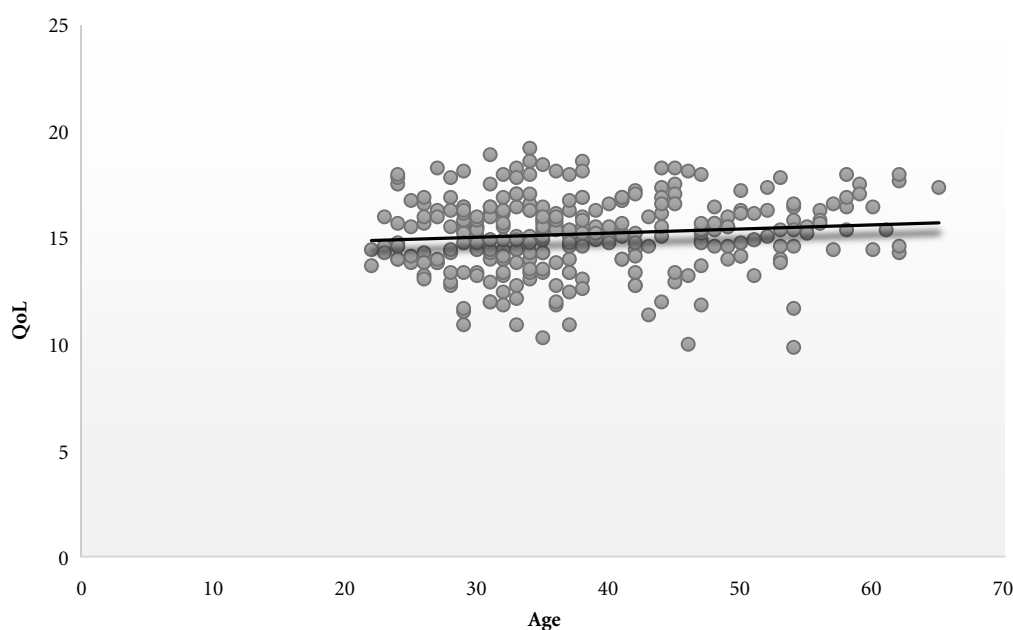

Figure 1. Correlation between age and QoL.

Table 2. Sociodemographic data by area of knowledge (N = 284).

Variable	Health	Human sciences	Sciences	Agricultural sciences
	(N = 113)	(N = 82)	(N = 51)	(N = 38)
Sex				
Male	50 (44.2%)	48 (58.5%)	40 (78.4%)	27 (71.1%)
Female	63 (55.8%)	34 (41.5%)	11 (21.6%)	11 (28.9%)
Marital status				
Married	80 (70.8%)	52 (46%)	34 (66.7%)	27 (71.1%)
Single	26 (23%)	21 (25.6%)	13 (25.5%)	8 (21.1%)
Divorced	7 (6.2%)	1 (1.2%)	4 (7.8%)	2 (5.3%)
Widow	0 (0%)	8 (9.8%)	0 (0%)	1 (2.6%)
Age(years)				
20-30	24 (21.2%)	20 (24.4%)	21 (41.2%)	2 (5.3%)
31-40	65 (57.5%)	24 (29.3%)	14 (27.5%)	11 (28.9%)
41-50	14 (12.4%)	26 (31.7%)	11 (21.6%)	11 (28.9%)
Over 51	10 (8.8%)	12 (14.6%)	5 (9.8%)	14 (36.8%)

Table 3. Health-related variables by area of knowledge (N = 284).

Variables	Health	Human sciences	Sciences	Agricultural sciences	QoL	QWL
	(N = 113)	(N = 82)	(N = 51)	(N = 38)	(N = 284)	(N = 284)
Diagnosed with an illness						
Yes	18 (15.9%)	13 (15.9%)	4 (7.8%)	8 (21.1%)	14.75±1.68	3.4±0.034
No	95 (84.1%)	69 (84.1%)	47 (92.2%)	30 (78.9%)	15.27±1.75	3.42±0.43
Sick leave						
Yes	17 (15%)	6 (7.3%)	8 (15.7%)	4 (10.5%)	14.56±1.71	3.31±0.43
No	96 (85%)	76 (92.7%)	43 (84.3%)	34 (89.5%)	15.29±1.73[*]	3.44±0.42
Use of medication						
Yes	31 (27.4%)	25 (30.5%)	17 (33.3%)	15 (39.5%)	14.87±1.75	3.46±0.40
No	82 (72.6%)	57 (69.5%)	34 (66.7%)	23 (60.5%)	15.35±1.72[**]	3.41±0.42
Smoker						
No	110 (97.3%)[***]	71 (86.5%)[***]	49 (96%)	33 (86.8%)	15.22±1.75	3.42±0.47
Occasional	1 (0.9%)	8 (9.8%)	1 (2%)	5 (13.2%)	14.59±1.66	3.29±0.31
Frequent	2 (1.8%)	3 (3.7%)	1 (2%)	0 (0%)	15.78±1.85	3.51±0.69
Drinker						
No	53 (46.9%)	37 (45.1%)	22 (43.1%)	11 (28.9%)	15.31±1.73	3.47±0.43
Occasional moderate	57 (50.4%)	35 (42.7%)	28 (54.9%)	26 (68.5%)	15.11±1.8	3.37±0.4
Occasional excessive	2 (1.8%)	6 (7.3%)	0 (0%)	1 (2.6%)	15.16±1.9	3.5±0.55
Frequent moderate	1 (0.9%)	4 (4.9%)	1 (2%)	0 (0%)	15.23±0.94	3.58±0.32
Leisure activity						
None	28 (24.8%)	21 (25.6%)	15 (29.4%)	7 (18.4%)	15.09 ±1.77	3.30±0.41
1-2 times a week	66 (58.4%)[†]	47 (57.3%)	31 (60.8%)	25 (65.8%)	15.55±1.68[†]	3.44±0.43
3-4 times a week	16 (14.2%)[†]	11 (13.3%)	3 (5.8%)	4 (10.4%)	16.02±1.65[†]	3.54±0.37
5-6 times a week	3 (2.6%)	1 (1.2%)	1 (2%)	1 (2.6%)	14.89±2.2	3.52±0.32
Everyday	0 (0%)	2 (2.4%)	1 (2%)	1 (2.6%)	15.5±0.65	3.54±0.47
Hobby						
Yes	62 (54.9%)	45 (54.9%)	31 (60.8%)	13 (34.2%)	15.21±1.76	3.47±0.41
No	51 (45.1%)	37 (45.1%)	20 (39.2%)	25 (65.8%)	15.17±1.75	3.39±0.42

Table 3. Health-related variables by area of knowledge (N = 284).

Variables	Health	Human sciences	Sciences	Agricultural sciences	QoL	QWL
	(N = 113)	(N = 82)	(N = 51)	(N = 38)	(N = 284)	(N = 284)
Physical activity						
Sedentary	31 (27.4%)	27 (32.9%)	11 (21.6%)	9 (23.7%)	14.65±1.74	3.27±0.43
Occasional low-intensity	29 (25.8%)	25 (30.5%)	15 (29.5%)	17 (44.7%)	15.09±1.83	3.39±0.43
Occasional moderate-intensity	7 (6.2%)	7 (8.5%)	4 (7.8%)	0 (0%)	15.49±1.76	3.49±0.38
Regular low-intensity	17 (15%)	8 (9.8%)	7 (13.7%)	3 (7.9%)	15.29±1.52	3.53±0.35
Regular moderate-intensity	18 (15.9%) [††]	12 (14.6%)	9 (17.6%)	8 (21.1%)	15.85±1.62[††]	3.54±0.39 [††]
Regular high-intensity	11 (9.7%)	3 (3.7%)	5 (9.8%)	1 (2.6%)	15.74±1.4	3.52±0.31
Sleep assessment						
Very good	21 (18.6%)	12 (14.6%)	8 (15.7%)	6 (15.8%)	15.85±1.74 [†††]	3.53±0.48 [†††]
Good	39 (34.5%) [†††]	34 (41.5%) [†††]	21 (41.2%)	19 (50%)	15.75±1.51 [†††]	4.38±0.39
Moderate	38 (33.6%)	28 (34.1%)	14 (27.5%)	8 (21.1%)	14.64±1.5	3.33±0.37
Bad	12 (10.6%)	8 (9.8%)	8 (15.6%)	3 (7.8%)	13.66±1.81	3.22±0.43
Very bad	3 (2.7%)	0 (0%)	0 (0%)	2 (5.3%)	15.64±2.69	3.53±0.33
Diet						
Balanced	64 (56.6%)	52 (63.4%) [‡]	28 (54.9%)	31 (81.6%) [‡]	16.76±1.25 [‡]	3.44±0.42
Vegetarian	1 (0.9%)	1 (1.2%)	1 (2%)	0 (0%)	15.5±1.58	3.40±0.48
Imbalanced	48 (42.5%)	29 (35.4%)	22 (43.1%)	7 (18.4%)	14.71±1.84	3.39±0.41

*Compared to those who had not taken sick leave; ** Compared to those who use medication; *** Compared to smokers (QWL); †Compared to those who do not practiceleisure activities (QoL); ††Compared to those who are sedentary (QoL and QWL); †††Compared to those who havemoderate or bad sleep; ‡Compared to those who have animbalanced diet (QoL). Analysis performed using the Mann-Whitney U test and Kruskall-Wallis test, adopting p <0.05. QoL: quality of life; QWL: quality of working life.

practiced moderate-intensity physical activity (QoL = 15.08 ± 1.77 and QWL = 3.32 ± 0.44), and those who regularly practiced low-intensity physical activity (QoL = 14.97 ± 1.67). Finally, the findings show that in the areas of agricultural sciences (QoL = 15.84 ± 1.07) and human sciences (QoL = 15.67 ± 1.53) teachers with a balanced diet showed higher QoL scores (p = 0.030, agricultural sciences and p = 0.007, human sciences) than those with an imbalanced diet (QoL = 14.68 ± 1.36 for agricultural sciences and QoL = 14.44 ± 1.54 for human sciences).

Discussion

Teachers are committed and devoted to their profession. However, certain peculiarities of the profession can negatively influence aspects of teachers' health, which, as confirmed by this study, is reflected in the QoL and QWL of teachers in the form of low sleep quality, low levels of leisure and physical activity, and a poor diet, for example.

Work is an important part of our lives and can bring self-fulfillment, satisfaction, QoL, and even health. However, it can also have a negative effect on health, depending on the type of work, environment, working conditions, and how work is organized[2,9].

As in other professions, ill-health among teachers may be associated with various aspects and is related to low levels of QoL. It is therefore important to gain a deeper understanding of teachers' health, exploring the biological, ergonomic, occupational, and psychosocial mechanisms underlying teaching, and to invest in practices that improve communication and interaction between workers[14,15].

Emotional and mental exhaustion can make teachers feel fragile, irritated, and anxious, affecting basic physiological needs like physical and mental rest. Teachers find working with people draining for their health, either because of the stress caused by direct interaction with students, or due to other interactions in the university environment, particularly those that determine attitudes that go against their principles and affect their availability. They themselves are aware that such situations can lower their immunity and affect overall health, giving rise to frequent colds, migraines, labyrinthit is, hypertensive crises, depression, skin problems, etc.[16].

This situation is exacerbated by current employment trends and worsening working terms and conditions in the university teaching profes-

sion: the dismissal of experienced teachers with doctorate degrees, giving way to specialists and graduates; high temporary teacher turnover; emphasis on the "less teachers, more students" logic; salary reductions, without any prospect of recovering lost wages; output-based teacher performance, making it difficult to promote practices aimed at social transformation; and the inseparability of teaching, research, and extension. In addition to low salaries, teachers are often forced to get second or third jobs, teaching a wide range of subjects (some of which incompatible with their academic background) and stretching themselves to the limit to manage their work load. All these factors have an impact on work and undoubtable consequences for teachers' health[6,17].

These considerations are corroborated by the findings of the present study, which show that teachers with a history of sickness absence have lower QoL. In addition to the abovementioned factors, when a teacher who has been absent due to sickness returns to work, he/she must also reassume extra-class activities. At the same time, various factors have an impact on this phase and on QoL, such as the need to update knowledge, engagement with new work colleagues and managers, new functions, changes in routine and work hours, and readaption to student interaction[6].

Many teachers do not take sick leave, yet use medication, which was associated with lower QoL. This is despite the fact that a large part of those who use medication did not report having an illness, suggesting that they are self-medicated. Self-medication is defined as the selection and use of medicines by individuals, or a member of the individuals' family, to treat self-diagnosed conditions or symptoms[18]. This attitude incurs a number of risks, such as incorrect self-diagnosis, delays in seeking medical advice, adverse reactions, drug interactions, incorrect use/dosage, wrong choice of drug, masking of severe diseases, and drug dependence and abuse[18,19].

An investigation into the motives behind self-medication and how it occurs was beyond the scope of this study; however, given the multiple aspects of university teaching, this fact may explained by the following main factors: lack of time for good self-care, anxiety, and persistent pain[8,16,20-22].

Musculoskeletal pain is common among teachers, affecting between 90 and 100% of the profession. The high prevalence of this condition may be explained by the positions adopted by teachers in the classroom, such as elevated shoul-

der positions and standing or sitting for long periods[15,21-24].

Another factor that can trigger or aggravate muscle pain is anxiety, which leads to increased muscle tension. Anxiety can be exacerbated by poor working terms and conditions and work organization, which result in conflicts and tension in the workplace, leading to withdrawal or escape from stressful situations, coping, and rupture. This promotes dissension, whereby teachers feel a sense of collective social responsibility and recognize that the provision of quality education is a fundamental human right, but at the same time are undervalued by the government and society, underpaid, lack job security, and often need to have a second or third job to complement their income[6,7,17].

Anxiety is a symptom that commonly accompanies depression and excessive stress. It is defined as a diffuse, unpleasant, vague sense of apprehension or tension, often accompanied by physical sensations, such as headaches, palpitations, muscle tension, perspiration, and trembling[25-28].

The findings also show that teachers in the areas of health and human sciences who smoke showed a lower QoL score. This may be partially explained by anxiety and stress, given that teachers in this are a have to deal with stressful situations at work. Although many smokers do not necessarily have evident health problems, burning tobacco releases potentially harmful chemicals and smokers tend to show poorer-than-average health, less vitality, and more pain symptoms and emotional and mental problems (depression, low self-esteem, predisposition to unhealthy lifestyles) than non-smokers[29,30].

Smoking has an effect on self-perceived health, regardless of its somatic effects. For example, smoking is associated with stress and social adaptation problems, which in turn affect self-perception of QoL. Lack of vitality associated with smoking can be explained by lung impairment caused by mucosal, low diffusing capacity, increased carbon monoxide in the lungs, and peripheral airway obstruction. Another mechanism that may explain the differences in QoL scores among smokers is musculoskeletal injury due hypoxic pulmonary vasoconstriction, which impairs tissue perfusion and nutrition[29-31].

Another factor that contributes to lower QoL and QWL is poor sleep quality. Our findings show that teachers with poor sleep quality showed lower QoL and QWL scores. According to Souza and Reimão[32], poor sleep quality or insomnia affects QoL and chronic insomnia is generally associated with mental and behavioral disorders.

Souza et al.[33] reported that 46 to 51% of teachers assessed by their study showed excessive daytime sleepiness and poor sleep quality, with affect not only health and QoL, but also performance. Poor sleep quality may be caused by a number of factors, including social demands, noise levels, and occupational characteristics (work overload, high stress levels, extra-classroom activities, and organizational factors, among others)[33,34]. Sleep quality negatively affects not only QoL, but also vocal quality, jeopardizing teaching and diminishing teacher productivity[35].

In addition to anxiety, depression, musculoskeletal pain, and stress, other findings corroborate sleep loss or poor sleep quality reported by the teachers, given that those who showed lower frequencies of leisure and physical activity and an imbalanced diet showed lower QoL.

Teachers in the areas of health and human sciences who reported good sleep quality showed higher QoL scores, were less likely to use medications, and practiced leisure activities more regularly. Moreover, teachers in the area of health who occasionally practiced moderate-intensity physical activity reported higher QoL. Physical activity helps to reduce stress, benefitting body systems through the release of endogenous opioids and enhancing well-being and relaxation[36,37]. Teachers in the areas of human sciences and agricultural sciences with a balanced diet, which is important for maintaining homeostatic balance and sleep quality, also showed higher levels of QoL[38]. In addition to the factors mentioned above, it is important to stress that salary and benefit cuts, lack of recognition, and a reduction in financial support for research and extension activities affect the emotional well-being of teachers and have a negative impact on sleep[7].

Another factor that influences QoL is lifestyle. In this respect, the results suggest that having a sedentary lifestyle is one of the leading causes of ill-health among many of the teachers. In this respect, teachers in the area of health who practiced regular physical activity showed better overall health and higher levels of QoL[36,37].

Physical activity is also seen by some people as leisure activity, has a positive impact on health promotion, and is positively associated with QoL[36]. Furthermore, improvements in QoL are perceived when physical activity is directed towards prevention/promotion, rehabilitation, or disease management, principally because people who practice physical activity show enhanced response to illness and disorders that reduce func-

tional and work capacity[39,40]. Physical activity stimulates the muscular system, which in turn balances the forces acting on the joints, reducing joint overload and thus lowering pain and enhancing well-being[41]. Moreover, regular physical exercise provides emotional benefits through the increased production of endorphins by the central nervous system, reducing stress, anxiety, depression, and emotional tension and improving socialization, sleep quality, well-being, and therefore QoL[39].

QoL would likely be better in the absence of excessive activities and a workload. These factors make it more difficult for teachers to find time for leisure and recreational activities, which can aggravate physical and mental exhaustion[42]. Leisure activity enhances disposition and mental agility, reduces stress and improves time management. It is also positively associated with good health, not only in terms of absence of illness, but also life satisfaction and improved stress management. In addition, social relationships have an anti-stress effect and enhance satisfaction[43].

In view of the above, closer attention needs to be paid to factors influencing the QoL, and consequently health, of university teachers, given that the profession places significant demands on their physical, intellectual, sentimental, and emotional capacities.

Conclusion

Various factors associated with health negatively affect the QoL and QWL of university teachers in the areas of health, sciences, human sciences, and agricultural sciences, including poor sleep quality, leading a sedentary lifestyle, lack of leisure activity, use of medications (self-medication), sick leave, and having an imbalanced diet. Furthermore, advanced age is associated with higher QoL scores.

Collaborations

HM Sanchez and EGM Sanchez: study conception and design, data analysis and interpretation, and drafting of the article and critical revision and approval of the version to be published; EC Guimarães: study design, data analysis and interpretation, and critical revision of the article;

MA Barbosa e CC Porto: study conception and design, data interpretation, and critical revision of the article.

References

1. Bureau International du Travail (BIT). Emploi et conditions de travail dês ensaignants. Geneve: BIT; 1981.
2. Bogaert I, De Martelaer K, Deforche B, Clarys P, Zinzen E. Associations between different types of physical activity and teacher's perceived mental, physical, and work-related health. *BMC Public Health* 2014; 14(534):1-9.
3. Kovess-Masféty V, Sevilla-Dedieu C, Rios-Seidel C, Nerrière E, Chan Chee C. Do teachers have more health problems? Results from a French cross-sectional survey. *BMC Public Health* 2006; 6(101):1-13.
4. Silva AA, Fischer FM. Teacher's sick leave due to mental and behavioral disorders and return to work. *Work* 2012; 41:5815-5818.
5. Santos SDM. A precarização do trabalho docente no Ensino Superior: dos impasses às possibilidades de mudanças. *Educar em Revista* 2012; 46:229-244.
6. Bosi AP. A precarização do trabalho docente nas Instituições de Ensino Superior do Brasil nesses últimos 25 anos. *Educ. Soc.* 2007; 28(101):1503-1523.
7. Anastasiou GC, Pimenta SG. *Docência no ensino superior*. São Paulo: Cortez; 2002.
8. Lima MFEM, Lima-Filho DO. Work and health conditions of university professors. *Ciências & Cognição* 2009; 14(3):62-82.
9. Delcor NS, Araújo TM, Reis EJFB, Porto LA, Carvalho FM, Silva MO, Barbalho L, Andrade JM. Condições de trabalho e saúde dos professores da rede particular de ensino de Vitória da Conquista, Bahia, Brasil. *Cad Saud Publica* 2004; 20(1):187-196.
10. Martin AJ, Stockler M. Quality of life assessment in health care research and practice. *Evaluation & Health Professions* 1998; 21(2):141-156.
11. Minayo MCS, Hartz ZMA, Buss PM. Qualidade de vida e saúde: um debate necessário. *Cien Saude Colet* 2000; 5(1):7-18.
12. Pedroso B, Pilatti LA, Gutierrez GL, Picinin CT. Construction and validation of TQWL-42: a quality of work life measurement instrument. *Revista de Salud Publica* 2014; 16:885-896.
13. Fleck MPA, Louzada S, Xavier M, Chachamovich E, Vieira G, Santos L, Pinzon V. Aplicação da versão em português do instrumento abreviado de avaliação da qualidade de vida "WHOQOL-Bref". *Rev Saude Publica* 2000; 34(2):178-183.
14. Horn JE, Taris TW, Schaufeli WB, Schreurs PJG. The structure of occupational well-being: a study among Dutch teachers. *J Occup Organ Psychol* 2004; 77:365-375.
15. Ceballos AGC, Santos GB. Factors associated with musculoskeletal pain among teachers: sociodemographics aspects, general health and well-being at work. *Rev. bras. epidemiol.* 2015; 18(3):702-715.
16. Silvério MR, Patrício ZM, Brodbeck IM, Grosseman S. O ensino na área da saúde e sua repercussão na qualidade de vida docente. *Revista Brasileira de Educação Médica* 2010; 34(1):65-73.
17. Gaspar RF, Fernandes TC. Oligopolização e precarização do trabalho docente no ensino superior privado brasileiro: causas, conexões e consequências. *Rev Espaço Acadêmico* 2015; 168:77-92.

18. Ruiz ME. Risks of self-medication practices. *Curr Drug Saf* 2010; 5(4):315-323.

19. Hughes CM, Mcelnay JC, Fleming GF. Benefits and risks of self medication. *Drug Saf* 2001; 24(14):1027-1037.

20. Kumar D, Deo JM. Stress and work life of college teachers. *Journal of the Indian Academe of Applied Psychology* 2011; 37:78-85.

21. Koetz L, Rempel C, Périco E. Quality of life of professors of higher education community institutions in the state of Rio Grande do Sul, Brazil. *Cien Saude Colet* 2013; 18(4):1019-1028.

22. Sanchez HM, Gusatti N, Sanchez EGM, Barbosa MA. Incidência de dor musculoesquelética em docentes universitários. *Rev Bras Med Trab* 2013; 11(2):66-75.

23. Carvalho AJFP, Alexandre NMC. Sintomas osteomusculares em professores do ensino fundamental. *Rev Bras Fisioter* 2006; 10(1):35-41.

24. Cardoso JP. Prevalência de dor musculoesquelética em professores. *Rev Bras Epidemiol* 2009; 12(4):604-614.

25. Cheniaux E. *Manual de Psicopatologia*. 5ª ed. Rio de Janeiro: Guanabara Koogan; 2015.

26. Zurlo MC, Pes D, Cooper CL. Stress in teaching: A study of occupational stress and it's determinants among Italian school teachers. *Stress and Health* 2007; 23:231-241.

27. Stoeber J, Rennert D. Perfectionism in school teachers: Relations with stress appraisals, coping styles, and burnout. *Anxiety, Stress, & Coping* 2008; 21(1):37-53.

28. Robinson JA, Sareen J, Cox BJ, Bolton JM. Correlates of self-medication for anxiety disorders: results from the National Epidemiolgic Survey on Alcohol and Related Conditions. *J Nerv Ment Dis* 2009; 197(12):873-878.

29. Cayuela A, Rodríguez-DomínguezS, Otero R. Deteriorated Health-Related Quality of Life in Healthy Male Smokers. *Arch Bronconeumol* 2007; 43:59-63.

30. Kiyohara K, Itani Y, Kawamura T, Matsumoto Y, TakahashiY. Changes in the SF-8 scores among healthy non-smoking school teachers after then forcement of smoke-free school policy: a comparison by passive smoke status. *Health and Quality of Life Outcomes* 2010; 8(44):2-8.

31. Tomioka H, Sekiya R, Nishio C, Ishimoto G. Impact of smoking cessation therapy on health-related quality of life. *BMJ Open Resp Res* 2014; 1:1-9.

32. Souza JC, Reimão R. Epidemiologia da insônia. *Psicol Estud* 2004; 9(1):3-7.

33. Souza JC, Sousa IC, Belísio AS, Azevedo CVM. Sleep habits, daytime sleepiness and sleep quality of high school teachers. *Psychol Neurosci* 2012; 5(2):257-263.

34. Qin J, Liu W, Zhu J, Weng W, Xu J, Ai Z. Health Related Quality of Life and Influencing Factors among Welders. *PLoS One* 2014; 9(7):e101982.

35. Pizolato RA, Rehder MI, Meneghim MC, Ambrosano GM, Mialhe FL, Pereira AC. Impact on quality of life in teachers after educational actions for prevention of voice disorders: a longitudinal study. *Health Qual Life Outcomes* 2013; 11:28.

36. Pucci GCMF, Rech CR, Fermino RC, Reis RS. Associação entre atividade física e qualidade de vida em adultos. *Rev Saude Publica* 2012; 46(1):166-179.

37. Gill DL, Hammond CC, Reifsteck EJ, Jehu CM, Williams RA, Adams MM, Lange EH, Becofsky K, Rodriguez E, Shang YT. Physical Activity and Quality of Life. *J Prev Med Public Health* 2013; 46(1):28-34.

38. Crispim CA, Zimberg IZ, Dos Reis BG, Diniz RM, Tufik S, Mello MT. Relationship between Food Intake and Sleep Pattern in Healthy Individuals. *J Clin Sleep Med* 2011; 7(6):659-664.

39. Penedo FJ, Dahn JR. Exercise and Well-Being: A Review of Mental and Physical Health Benefits Associated With Physical Activity. *Curr Opin Psychiatry* 2005; 18(2):189-193.

40. Gillison FB, Skevington SM, Sato A, Standage M, Evangelidou S. The effects of exercise interventions on quality of life in clinical and healthy populations; a meta-analysis. *Soc Sci Med* 2009; 68(9):1700-1710.

41. Abell JE, Hootman JM, Zack MM, Moriarty D, Helmick CG. Evidence based public health policy and practice: Physical activity and health related quality of life among people with arthritis. *J Epidemiol Community Health* 2005; 59(5):380-385.

42. Fernandes MH, Rocha VM. Impact of the psychosocial aspects of work on the quality of life of teachers. *Rev Bras Psiquiatr* 2009; 31(1):15-20.

43. Ajibua MA, Olorunsola HK, Bewaji OB. Perceived motivational factors influencing leisure-time physical activity involvement of teaching and nonteaching staff in tertiary institutions in Ondo state, Nigeria. *Inter J Asian Soc Sci* 2013; 3(1):10-19.