

**METALÚRGICOS: ESTRESSE, HÁBITOS DE VIDA E SENTIMENTOS
PESSOAIS. PREVALÊNCIA ENTRE COLABORADORES**

**METALÚRGICOS: ESTRÉS, HÁBITOS DE VIDA Y SENTIMIENTOS
PERSONALES. PREVALENCIA ENTRE EMPLEADOS**

**METALLURGICALS: STRESS, LIFE HABITS AND PERSONAL
FEELINGS. PREVALENCE AMONG EMPLOYEES**

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Abstract

Objective: This study aims to verify the incidence of stress and how much it relates to individual characteristics, life habits and personal feelings of metallurgists of a multinational company in the region of Curitiba.

Methodology: It is a cross-sectional, descriptive, quantitative study. A survey was conducted using the questionnaire “Perceived Stress Scale” (PSS) and sociodemographic questionnaire with metallurgical employees in 2015. The data were analyzed using descriptive statistics, Fisher’s exact test and Pearson’s Chi-square.

Results: Of the 2,200 employees of the company, 1952 (88.7%) were able to participate in the study, 636 of whom (32.58%) were in a situation of stress. There was a prevalence of stress in female individuals, people with sedentary behaviors, smokers, indebted, in those who expressed dissatisfaction with the salary, with the profession and with negative feelings regarding their lives. Thus, the variables that showed a statistically significant relationship with stress ($p < 0.05$) were: sex, physical activity, smoking, satisfaction with salary, work and private life.

Conclusion: The study showed an incidence of stress in the metallurgists below the statistics of the working population in general and there was a statistically significant relationship between stress in most of the studied variables regarding life habits and personal feelings.

Keywords: stress; perceived stress scale; stress and psychosocial factors.

Resumo

Objetivo: Este estudo tem como objetivo verificar a incidência de estresse e o quanto ele se relaciona com características individuais, hábitos de vida e sentimentos pessoais de metalúrgicos de uma empresa multinacional da região de Curitiba.

Metodologia: É um estudo transversal, descritivo e quantitativo. Foi realizada uma pesquisa por meio do questionário "Escala de Estresse Percebido" (PSS) e questionário sociodemográfico com funcionários metalúrgicos em 2015. Os dados foram analisados por meio de estatística descritiva, teste exato de Fisher e Qui-quadrado de Pearson.

Resultados: Dos 2.200 funcionários da empresa, 1.952 (88,7%) puderam participar do estudo, dos quais 636 (32,58%) se encontravam em situação de estresse. Houve prevalência de estresse em indivíduos do sexo feminino, pessoas com comportamentos sedentários, fumantes, endividados, naqueles que expressaram insatisfação com o salário, com a profissão e com sentimentos negativos em relação à vida. Assim, as variáveis que apresentaram relação estatisticamente significativa com o estresse ($p < 0,05$) foram: sexo, atividade física, tabagismo, satisfação com o salário, trabalho e vida privada.

Conclusão: O estudo mostrou uma incidência de estresse nos metalúrgicos abaixo das estatísticas da população ocupada em geral e houve relação estatisticamente significativa entre estresse na maioria das variáveis estudadas em relação aos hábitos de vida e sentimentos pessoais.

Palavras-chave: estresse; escala de estresse percebido; estresse e fatores psicossociais.

Resumen

Objetivo: Este estudio tiene como objetivo verificar la incidencia del estrés y su relación con las características individuales, hábitos de vida y sentimientos personales de los metalúrgicos de una empresa multinacional de la región de Curitiba.

Metodología: Es un estudio transversal, descriptivo y cuantitativo. Se realizó una encuesta utilizando el cuestionario "Perceived Stress Scale" (PSS) y un cuestionario sociodemográfico con empleados metalúrgicos en 2015. Los datos se analizaron mediante estadística descriptiva, prueba exacta de Fisher y Chi-cuadrado de Pearson.

Resultados: De los 2.200 empleados de la empresa, 1952 (88,7%) pudieron participar en el estudio, de los cuales 636 (32,58%) se encontraban en situación de estrés. Prevalció el estrés en individuos del sexo femenino, personas con conductas sedentarias, fumadores, endeudados, en quienes expresaron insatisfacción con el salario, con la profesión y con sentimientos negativos con respecto a su vida. Así, las variables que presentaron relación

estadísticamente significativa con el estrés ($p < 0,05$) fueron: sexo, actividad física, tabaquismo, satisfacción con el salario, trabajo y vida privada.

Conclusión: El estudio mostró una incidencia de estrés en los metalúrgicos por debajo de las estadísticas de la población ocupada en general y hubo una relación estadísticamente significativa entre el estrés en la mayoría de las variables estudiadas en cuanto a hábitos de vida y sentimientos personales.

Palabras clave: estrés; escala de estrés percibido; estrés y factores psicosociales.

1. Introduction

Mental illness in Brazil is the third most common cause of claiming social security benefits (Brasil 2015), but it is the first in the rankings regarding absenteeism of workers (Cadilhe et al. 1994). The future forecast by the World Health Organization (WHO) predicts that in 2020 mental illness will become the most prevalent cause of disability in an individual.

In this same context, stress in Brazil has already taken on alarming dimensions, the “International Stress Management Association”, placed Brazil in second place with more stressed employees in the world (30%), only behind Japan (70%) (International Stress Management 2012).

Stress not only appears as a major pathology, but also presents itself as a comorbidity in several other diseases, such as: asthma, diabetes mellitus, rheumatological diseases, cardiovascular diseases, and cancer, acting as a potentiating and aggravating factor, worsening the prognosis and increasing the consequences (Boll 2002; Cohen 2007).

There are different methodological ways to measure stress, which may evaluate the presence of psychological and physical symptoms arising from the state of stress, the presence of stressors, or the individual’s interpretation of stress, regardless of the stressors involved (Cohen 1987).

For Guillet and Hermand (2006), the perceived stress method is the best and most direct predictive measure of mental health, evaluating the individual’s relationship with the adversities of the environment, whatever it may be.

The Perceived Stress Scale (PSS) is one of the instruments available. This scale measures how much the interviewees perceive the events that occurred during the last month of their lives as unpredictable, uncontrollable, threatening and it was the questionnaire used in this research (Cohen 1988).

Therefore, this study aims to measure stress in metallurgists from a company located in the region of Curitiba, Paraná, south of Brazil, using the PSS scale. Our objective is to understand the relationship of stress with the individual characteristics, life habits and personal feelings of these employees.

2. Method

This is an exploratory, descriptive, quantitative, cross-sectional study. The valid information of 1952 employees of a multinational company in the metallurgical sector in Curitiba were evaluated. This number represents 88.7% of the total of 2200 employees of this company.

Two questionnaires were analyzed: a sociodemographic one, which aimed to identify the individual characteristics of each employee and the PSS (Perceived Stress Scale) composed of 10 items (Cohen 1983) that measure the perception of stress of each individual. Women that score above 16 and men that score above 18 points show positive results for stress (Reis 2005).

The study strategy followed the flow of activities in figure I.

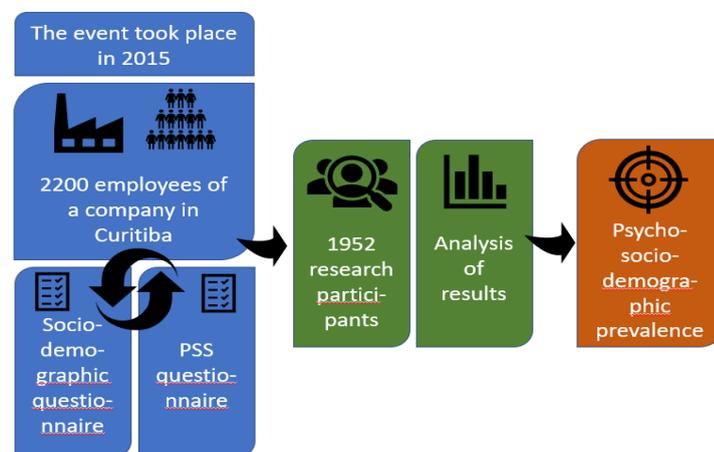


Figure I. Study design.
Source: Author, 2019.

This study was carried out using data provided and produced by the company during a satisfaction event in 2015. The data did not present nominal identifications and has no information that would allow us to locate the participants.

For this study, there is the agreement of the company and the approval of the ethics committee under the CAAE number: 23055119.4.0000.0020

The inclusion criteria for this study were four: (1) being a direct employee working in the company for at least three months, (2) being active in the company, (3) aged between 15

and 60 years, (4) being a volunteer with the Free Consent Form (FCF) completed and signed at the time.

The exclusion criteria were two: (1) having undergone surgery less than three months ago and (2) having suffered “emotional trauma” less than six months ago (divorce, death of a close relative, physical violence, etc.).

The statistical analysis was performed with the statistical program R (R Core Team 2016) and presented with quantities and percentages, providing extensive information on the scenario studied.

Qualitative variables, also called categorical variables, were those determined by two or more classes, for example, sex, age group, etc.

The Chi-square and Fisher’s exact tests were used for comparisons of the various qualitative characteristics, with the second being applied especially for smaller quantities.

When comparing the expected values with the observed values, the values from the statistical tests served as reference for the acceptance or rejection of the null hypothesis (with $p < 0.05$, the null hypothesis is rejected). Thus, in cases where $p < 0.05$, it is understood that the variables in question have a dependency relationship.

3. Results

Of the 2200 employees of the company, 1952 (88.73%) completed the questionnaires, signed the informed consent form and met the inclusion and exclusion criteria. Thus, the participants of this study and their answers were tabulated and then analyzed.

The analysis of the results is separated into two parts: the descriptive, to characterize the information; and the comparative, to verify the relationship and differences between the groups with and without stress.

3.1. Description

Table I shows the quantities and percentages of the general characteristics of the participants of the study. The employees were mostly male - 1640 (84%), obese - 1210 (62%) and married - 1406 (72.2%).

Table I. General information about the universe studied

<u>Variable</u>	<u>Quantity %</u>
Sex	
Female	312 (16)
Male	1640 (84)
Age	

15 – 24 years	302 (15.47)
25 – 54 years	1590 (81.45)
> 55 years	50 (2.56)
Did not answer	10 (0.46)
BMI	
Normal	672 (34.43)
Obesity and Overweight	1210 (61.99)
Did not answer	70 (3.58)
Marital status	
Married	1406 (72.2)
Other	19 (1)
Divorced	83 (4.3)
Single	433 (22.2)
Widowed	7 (0.4)
Did not answer	4 (0.20)

Source: Author, 2020.

Regarding life habits, only 486 (20.5%) of the employees engaged in regular physical activity, about 137 (7%) reported alcohol abuse and 126 (6.47%) were smokers (TableII).

Table II. Information about life habits (quantity and percentage)

Variable	Quantity (%)
Weekly physical activity	
Does not or irregular	1036 (53.1)
2 times a week or less	486 (24.9)
3 times a week or more	401 (20.5)
Did not answer	28 (1.5)
Alcoholic beverages	
Never	861 (44.1)
1 a 4 times monthly	938 (48.1)
2 or more per week	137 (7.0)
Did not answer	16 (0.8)
Smoking	
No	1785 (91.4)
Yes	126 (6.5)
Did not answer	41 (2.1)

Source: Author, 2019.

Debt situations, feelings about professional activity and perceptions regarding the life of the employee as a whole were also measured, the result is shown in table III.

Table III. Specific conditions (quantity and percentage information)

Variable	Quantity (%)
Indebtedness	
No	469 (24.0)
Yes	1453 (74.4)
Did not answer	30 (1.5)

Feeling about professional activity		
Dissatisfied	46	(2.4)
Not very satisfied	228	(11.7)
Satisfied	1157	(59.3)
Very satisfied	373	(19.1)
Totally satisfied	147	(7.5)
Did not answer	1	(0.05)
Feeling about life		
Dissatisfied	15	(0.8)
Not very satisfied	117	(6)
Satisfied	1087	(55.8)
Very satisfied	535	(27.5)
Totally satisfied	194	(10)
Did not answer	4	(0.2)

Source: Author, 2019.

In the PSS questionnaire, the 636 (32.58%) employees of this company were identified as stressed and 1316 (67.42%) were evaluated as not stressed (Figure II).

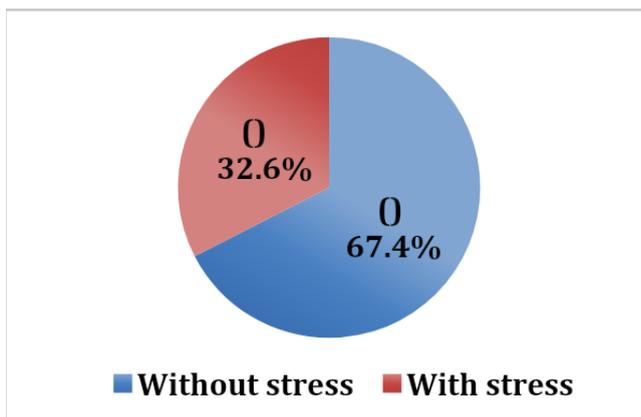


Figure II. Quantity and percentage of employees with and without stress according to the PSS
Source: Author, 2019.

3.2 Comparison of characteristics between groups with and without stress

There was a significant relationship between stress and sex ($p = 0.013$), with 31.4% of men and 38.8% of women showing stress. In addition, physical activity and smoking are significantly associated with stress, i.e. the lower the frequency of physical activity, the greater the proportion of stress. There is a predominance of stress among smokers (42.1%) in comparison to non-smokers (31.9%) (Table IV).

Table IV. Comparison between categorical variables with $p < 0.005$, which indicates a significant relationship.

Variable	With stress	Without stress	p-value
Sex			0.013
Female	121 (38.8)	191 (61.2)	

Male	515 (31.4)	1125 (68.6)	
Weekly physical activity			0.015
Any	243 (36.5)	423 (63.5)	
Sporadic	126 (34.1)	244 (65.9)	
1 to 2	138 (28.3)	349 (71.7)	
3 or more	119 (29.7)	282 (70.3)	
Did not answer	28	(1.43)	
Smoking			0.025
No	570 (31.9)	1215 (68.1)	
Yes	53 (42.1)	73 (57.9)	
Did not answer	41	(2.10)	

Source: Author, 2019.

All variables presented a dependency relationship with stress (Table V). Dissatisfaction with the salary, with the profession and with life show greater proportions of stress in relation to the satisfied ones.

Table V. Comparison of stress perception linked to monetary issues between the groups.

Variable	With stress	Without stress	p-value
Indebtedness			0.02
No	132 (28.1)	337 (71.9)	
Yes	495 (34.1)	958 (65.9)	
Did not answer	30	(1.53)	
Feeling about salary		< 0.001	
Dissatisfied	47 (66.2)	24 (33.8)	
Not very satisfied	149 (40.2)	222 (59.8)	
Satisfied	380 (30)	885 (70)	
Very satisfied	34 (22.8)	115 (77.2)	
Totally satisfied	21 (26.2)	59 (73.8)	
Did not answer	16	(0,8)	
Feeling about the profession		< 0.001	
Dissatisfied	28 (60.9)	18 (39.1)	
Not very satisfied	127 (55.7)	101 (44.3)	
Satisfied	368 (31.8)	789 (68.2)	
Very satisfied	90 (24.1)	283 (75.9)	
Totally satisfied	23 (15.6)	124 (84.4)	
Did not answer	01	(0.05)	
Feeling about life		< 0.001	
Dissatisfied	15 (100)	0 (0)	

Not very satisfied	87 (74.4)	30 (25.6)
Satisfied	407 (37.4)	680 (62.6)
Very satisfied	103 (19.3)	432 (80.7)
Totally satisfied	21 (10.8)	173 (89.2)
Did not answer	34	(1.74)

Source: Author, 2019.

There was no evidence of a significant relationship between stress and marital status, age groups, work time in the company, the number of people living together, body mass index (BMI), and the intake of alcoholic beverages (Table VI).

Table VI. Variables arranged in groups with and without stress.

Variable	Average (SD) with stress	Average (SD) without stress	P value
Age	36.2 (10.2)	36.4 (10.6)	0.663
Company time	12.12 (9)	12.56 (9.4)	0.537
Qty of people living together	2.63 (1.2)	2.6 (1.3)	0.443
BMI	26.67 (4.1)	26.58 (3.9)	0.68
Alcoholism			0.525

Source: Author, 2019.

4. Discussion

This study used the PSS questionnaire with 1952 metallurgists from a company in Curitiba, Paraná. The results showed an incidence of 32.58% stress and a statistically significant relationship ($p < 0.005$) of stress with sex, physical activity, smoking, indebtedness, and feelings about general aspects of life.

As it can be seen by analyzing Table VII, the incidence of stress (32.58%) found in this study with metallurgists was lower than the Brazilian estimates for adults in general (37%) (International Stress Management, 2015) and was also below the indications found in other studies with metallurgists - 41.8% (Souza, 2017). This fact is probably explained because the company where the study was conducted presents many benefits for its workers, specially their mental health programs.

Table VII. Stress in the various professional segments

Occupation	% with stress	Research Author
Teacher	35%	H. Reinhold

Youth athletes (swimming)	37%	S. Veri
Youth athletes (tennis and basketball)	50%	S. Veri
Athletes (soccer)	45%	S. Veri
Military policemen	65%	A. S. Romano
Executives	40%	M. N. Lipp
Journalists (daily written media)	62%	I. Proença
Labor Judges	70%	M. N. Lipp e S. Tanganelli
Bank employees	65%	A. C. Araújo
Metallurgicals	41.8%	I.G. Souza
Adult population in Brazil	37%	ISM
In this study with metallurgicals	32.58%	J. Trotta et al

Source: Marilda E. N. Lipp. Master's dissertations and research guided by Dra. Lipp. Modified by the Authors, 2020.

The correlations of the information obtained with the results from the PSS questionnaire showed that there was a prevalence of stress in females, which is in accordance with other studies (Guimarães 1996, 1999; Sands 2000).

Life habits, such as physical activity and smoking, also showed a statistically significant relationship of $p < 0.05$.

In relation to physical activity, it was observed in this study that the greater the frequency of physical activity, the proportionally lower is the presence of stress. Thus, it was found that those workers who practiced physical activities 3 or more times a week are less stressed, 70.3% of them had the PSS score without stress. In comparison, out of the group who practiced physical activities irregularly, 69.2% had no stress. Finally, out of those who were totally sedentary, 63.5% were without stress, showing that regular physical exercise is an important coping factor.

Of the people who had frequent and continuous indebtedness ($p = 0.02$), the majority of employees in this group 958 (65.9%), did not present stress according to the PSS, probably because this is not the triggering source of the perception of stress for them.

Regarding the feeling of satisfaction with the salary, 66% of the people who manifested themselves as dissatisfied presented stress, in the same way, so did the people who reported dissatisfaction with the profession (with 60.9%). Furthermore, out of the employees who indicated dissatisfaction with their own lives, 100% of them also had prevalence of stress. Thus, there is a relationship between stress ($p < 0.005$) and feelings about salary reward, with the activity they perform and with their life in general.

5. Conclusion

The study showed that, in this universe of metallurgical workers, the participants presented stress levels below expectations if compared to workers in general. In addition,

there was a positive correlation (with $p < 0.05$) of stress with: sex, physical activity, smoking, indebtedness, and feelings about the salary, profession and their life.

There was a demonstration of the prevalence of stress in female individuals, sedentary, smokers, indebted, in those who manifested dissatisfaction with their salary, with their profession and that presented generalized negative feelings about their lives.

The result of this study, using the Perceived Stress Scale questionnaire, allowed us to act objectively on the most relevant and significant factors to alleviate stress within the company, proposing actions to combat and cope with stress for the employees based on the improvement of life habits, professional guidance and personal motivational clarification.

This study was limited to a population of metallurgical workers from a single specific company. Therefore, we do not intend to generalize the results for an entire economic sector, nor even to detail in depth all the variables that involve stress. However, from what it was proposed, it has a significant number of participants and serves as a source of information about stress in metallurgists, mainly as inspiration for mental health promotion programs, social actions and/or new studies on the theme.

Finally, new multicenter studies should be considered to expand knowledge about stress within this sector.

Ethics Approval

Ethics approval followed the guidelines of the decree of Resolution No. 510 of 2016. Methodological Procedures of the Humanities and Social Sciences Areas published by the Ministry of Health - Brazil.

Declaration of Interest

All authors that sign this study state that they have no conflicts of interest to declare. The sole purpose of the study is for scientific knowledge.

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