ASSOCIATION OF JOB FUNCTION WITH CARDIOVASCULAR HEALTH AND QUALITY OF LIFE IN INDUSTRIAL SECTOR WORKERS

Filipe Moreira Gomides Sardinha Carvalhedo[1]
Pedro Henrique de Almeida Silva[2]
Sara Fernandes Correia[3]
Viviane Soares[4]
Universidade Evangélica de Goiás – UniEVANGÉLICA[1234]

ABSTRACT

Introduction: Workers in the industrial sector are subjected to various conditions that reduce cardiovascular health and quality of life. **Objective:** To associate the type of job function with the cardiovascular health and quality of life of industrial sector workers. **Methods:** Workers were stratified according to collar type (white: administration and blue: manual labor). CVH was assessed and classified based on the American Heart Association (AHA)'s *Life's Essential 8* (LE8) and quality of life was measured by the SF-36 questionnaire. **Results:** 82 industrial sector workers were evaluated. The results showed that white-collar workers perform more vigorous physical activities (∆= +86.78 min/week, p=0.003), have lower non-HDL cholesterol levels (∆= -20 mg/dL, p=0.036) and better blood pressure (∆= -8mmHg, p= 0.039). However, they report more physical limitations ((∆= -14.49%, p=0.03). There was an association between collar type and diet (p=0.026), nicotine exposure (p=0.007) and non-HDL cholesterol (p=0.040). **Conclusion:** White-collar workers had better CVH but reduced quality in limitations due to physical aspects. Thus, the encouragement of healthy eating, physical activity practice, and smoking reduction is suggested.

Keywords: Cardiovascular system; Occupational health; Quality of life.
.

INTRODUCTION

Work in the industrial sector leads to maintaining posture for long periods, the need for speed and high productivity, and increased commuting time between home and work since the industrial conglomerate is usually located far from the city center. These and other conditions can lead to worse eating habits, reduced physical activity, and the adoption of unhealthy lifestyle habits to relieve stress (CARDOSO; MORGADO, 2019). Even with the difference in roles within the industrial sector, all workers are to some degree affected by these conditions.

The aforementioned factors can directly affect the cardiovascular health (CVH) of workers and reduce their quality of life. The concept of CVH was established by the American Heart Association (AHA), which defined eight metrics called *Life's Essential 8* (LE8) to be used as indicators of CVH. It is an important framework because the metrics are associated with the risk of cardiovascular diseases (CVDs) (LLOYD-

JONES *et al*., 2022). Furthermore, they are part of those factors that contribute to a better quality of life regarding health-related behaviors (POOL *et al.,* 2019).

Since CVDs are the leading cause of death and increase morbidity, prevention and health promotion work is a safe and effective way to reduce these rates and improve the quality of life of industrial sector workers. It is worth highlighting the importance of assessing quality of life because it relates to the perception of physical and mental functioning, which, added to social and environmental factors, influences well-being and can be early predictors of diseases. Thus, the objective was to associate the type of job function with the cardiovascular health and quality of life of industrial sector workers.

METHODOLOGY

Sample

This is an analytical cross-sectional study. The present study was conducted on workers from the Anápolis Agroindustrial District (DAIA), Goiás. Workers were classified according to function: white collar - WC, who handle the administrative part (tend to work most of the time sitting) and blue collar - BC, generally responsible for services involving manual labor. Recruitment was done by invitation, totaling 168 employees; however, only 82 participated in the blood collection. Employees who had worked in the industry for at least 6 months, aged between 18 and 59 years, were included. Those with a clinical diagnosis of cognitive deficit, carriers of non-communicable chronic diseases, and those undergoing an acute infectious and/or inflammatory process were excluded.

Study Design

Collections were carried out between July and August 2024 (Approved by CEP-UniEVANGÉLICA: 6,898,839). Workers underwent evaluations before starting the daily work shift, in this order: filling out an identification form with age, sex, and collar type; body mass (kg) and height (m) were collected to calculate the body mass index (BMI); and waist circumference. Then the international physical activity questionnaire, the Mediterranean diet food frequency questionnaire, and the quality of life questionnaire were applied. Blood collections, to measure blood glucose and non-HDL cholesterol, were performed on pre-scheduled days by a specialized team in the morning period.

Evaluation Protocol

The CVH assessment followed the AHA recommendations, through the eight metrics. Health behaviors: diet (BACH-FAIG *et al.,* 2011), PA (MATSUDO, S. *et al.,* 2001), nicotine exposure (current smoker, stopped less than 12 months ago, and quit smoking more than a year ago or never used tobacco) and sleep health (BERTOLAZI et al, 2011). Health factors were: BMI, non-HDL cholesterol, blood glucose, and blood pressure (BP)(LLOYD-JONES *et al*., 2022). After establishing the score for each metric, an average was performed, and cardiovascular health was classified as: high (80 to 100 points), moderate (50 to 79 points), and low (0 to 49 points) (LLOYD-JONES *et al.*, 2022).

Quality of life was assessed using the Short Form -- 36, a questionnaire composed of 8 different components: functional capacity, physical limitations, pain, general health, vitality, mental health, social and emotional aspects. After its application, a score from 0 to 100 was generated, where the closer to 100, the more favorable the quality of life (CICONELLI *et al.,* 1999).

Data Analysis

Data were described as mean, standard deviation, frequencies, and percentages. The *Kolmogorov-Smirnov* test was used to verify data normality. For comparison between groups, the *Student's t-test* was used for independent samples (normal distribution) and the *Mann-Whitney* test (asymmetric distribution). The delta variation (Δ) was calculated by the difference between the means. The Chi-square test was used to associate collar type with cardiovascular health metrics. The software used in the analysis was the Statistical Package for Social Science (SPSS, version 27.0, IBM, Armonk, NY) and the excel package for graph construction.

RESULTS

Among the sample, 53 (64.6%) were WC and 29 (35.4%) were BC. Furthermore, WC workers had higher values for vigorous PA (p=0.003), while systolic blood pressure (SBP) (p=0.039) and non-HDL cholesterol (p=0.036) were lower. In contrast, the domain of limitations due to physical aspects (p=0.030) of quality of life was higher in BC workers.

Tabela 1 – Caracterização da amostra, saúde cardiovascular e qualidade de vida de trabalhadores do setor industrial de acordo como tipo de colarinho (n=81).

Variáveis	Trabalhadores da indústria		
	Colarinho branco (n= 53)	Colarinho azul (n= 29)	
	Média ± DP	Média ± DP	p*
Idade (anos)	31,00 ± 9,53	34,90 ± 10,36	0,090
Massa (kg)	78,80 ± 17,74	79,33 ± 13,17	0,880
Estatura (m)	1,71 ± 0,87	1,69 ± 0,11	0,373
CC (cm)	89,01 ± 15,20	91,20 ± 13,35	0,518
Saúde cardiovascular			
Dieta	28,51 ± 5,88	27,03 ± 6,23	0,294
NAF – Moderada (min/sem)	103,60 ± 146,92	211,03 ± 322,70	0,098
NAF – Vigorosa (min/sem)	112,64 ± 185,99	25,86 ± 64,50	0,003
Sono (h)	6,40 ± 1,23	6,70 ± 1,82	0,372
IMC (kg/m²)	19,31 ± 9,88	21,21 ± 9,75	0,405
PAS (mmHg)	124 ± 15	132 ± 20	0,039
PAD (mmHg)	81 ± 10	85 ± 15	0,212
Glicemia de jejum (mg/dL)	94 ± 15	97 14	0,311
Não HDL (mg/dL)	123 ± 47	146 ± 44	0,036
Escore SCV	70,82 ± 9,96	65,12 ± 13,85	0,057
Qualidade de vida			
Capacidade funcional	83,30 ± 20,09	90,34 ± 13,62	0,064
Limitação por aspectos físicos	76,89 ± 38,86	91,38 ± 20,34	0,030
Dor	69,33 ± 21,09	71,75 ± 20,46	0,617
Estado geral de saúde	54,18 ± 18,46	56,86 ± 16,91	0,521
Vitalidade	56,23 ± 21,23	55,34 ± 21,21	0,858
Aspectos sociais	77,35 ± 23,77	86,20 ± 18,09	0,085
Aspectos emocionais	71,06 ± 41,87	85,05 ± 35,17	0,113
Saúde mental	69,74 ± 19,57	66,07 ± 20,85	0,430

PAS - pressão arterial sistólica; PAD - pressão arterial diastólica; IMC – índice de massa corporal; NAF – nível de atividade física. *Dados para p<0,05.

When associating collar type with CVH metrics, an association was found with diet (p=0.026) (figure 1-A), nicotine exposure (p=0.007) (figure 1-B) and non-HDL cholesterol levels (p=0.040) (figure 1-D).

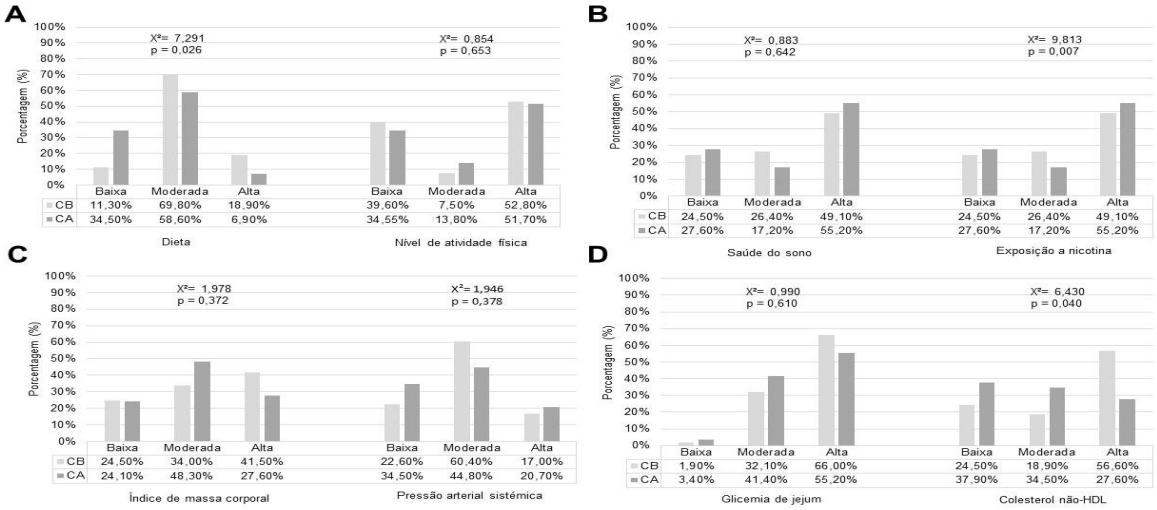

Figura 1 – Associação do tipo de colarinho com as métricas da SCV. **A**. Dieta e nível de atividade física. **B**. Saúde do sono e exposição a nicotina. **C**. índice de massa corporal e pressão arterial sistêmica. **D**. Glicemia de Jejum e colesterol não-HDL.

CONCLUSION

White-collar workers had better vigorous PA, SBP, and non-HDL cholesterol. In contrast, the domain of limitations due to physical aspects of quality of life was better in blue-collar workers. Furthermore, WC workers had a higher proportion of better diet and non-HDL cholesterol, while nicotine exposure was lower in the BC group. In this way, the importance of work is evidenced by demonstrating the changes in CVH associated with job function, and the need for health promotion in both groups is noted, encouraging healthy eating, physical activity, and smoking reduction.

ACKNOWLEDGEMENTS

Scientific Initiation Scholarship Program (PBIC) - UniEVANGÉLICA

REFERENCES

BACH-FAIG, A. *et al*. Mediterranean diet pyramid today. Science and cultural updates. **Public Health Nutrition**, v.14, p.2274–2284, 2011.

BERTOLAZI, A. N. *et al*. Validation of the Brazilian Portuguese versión of the Pittsburgh Sleep Quality Index. **Sleep Medicine,** v. 12, s/n, p. 70-75, 2011.

CARDOSO, A. C; MORGADO, L. Trabalho e saúude do trabalhador no contexto atual: ensinamentos da Enquete Europeia sobre Condições de Trabalho.**Saúde Soc,** v. 28, n. 1, p. 169-181, 2019.

CICONELLI, R. M. *et al.* Tradução para a linga portuguesa e validação do questionário genérico de avaliação de qualidade de vida SF-36 (Brasil SF-36). **Ver. Bras. Reumatol**. v.39, n.3, s/n, 1999.

LLOYD-JONES, D. M. *et al*. Life's Essential 8: Updating and Enhancing the American Heart Association's Construct of Cardiovascular Health: A Presidential Advisory From the American Heart Association. **Circulation**, v. 146, n. 5, p. e18-e43, 2022.

MATSUDO, S. *et al.* Questionário Internacional De Atividade Física (Ipaq): Estupo De Validade E Reprodutibilidade No Brasil. Questionário Internacional De Atividade Física (Ipaq): Estupo De Validade E Reprodutibilidade No Brasil. **Revista Brasileira de Atividade Física e Sáude**, v. 6, n. 2, p. 5–18, 2001.

POOL, L. R. *et al.* Association of cardiovascular health through early adulthood and healthrelated quality of life in middle age: The Coronary Artery Risk Development in Young Adults (CARDIA) Study. **Preventive Medicine**, v. 126, s/n, s/p, 2019.