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Absenteeism and Associated Factors in Workers of a High-Level Educational Institution, Cartagena-Colombia

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Abstract

To analyze the sociodemographic characteristics, organizational factors and cardiovascular risk factors related to work absenteeism in a higher education institution in the city of Cartagena-Colombia. Cross-sectional analytical study with a probabilistic sample of 162 workers. We recorded sociodemographic data, personal and family history, in addition, we performed a physical examination that included: abdominal circumference, height, weight and blood pressure. Also, clinical laboratory tests were performed for the analysis of lipid profile (total cholesterol, HDL cholesterol and triglycerides) and fasting blood glucose, determined by enzymatic colorimetric and automated methods. A frequency of absenteeism of 24.7% was estimated, being more frequent in the age group of 40 to 49 years and with a statistically significant difference between women and men. All the organizational variables studied showed a statistical association with work absenteeism. In contrast, the only cardiovascular risk factors that showed statistical association were: abdominal obesity and personal history of arterial hypertension. The evidences found allow us to think about the need to implement, immediately, a program of lifestyle change and healthy work, which includes a motivational strategy of change that, together, reduce the occurrence of absenteeism and the prevalence of cardiovascular risk factors found in the study population.

Keywords: absenteeism, sick leave, education, higher, physical activity

1. Introduction

Work absenteeism, defined as the absence of an employee to his workplace for reasons of illness or accident, excluding vacations, strikes, pregnancy or prison (Gomero, Murguia, Calizaya, Mejia, & Sanchez, 2018), is considered a multifactorial phenomenon with capacity to affect companies, workers and the general economy of a country (Rabarison, Lang, Bish, Bird, & Massoudi, 2017).

Generally, factors associated with work absenteeism could be classified into two categories, those related to health and sociodemographic characteristics of the employee and organizational factors, such as: seniority, type of hiring, salary, position, workday, satisfaction, among others (Barmby, Ercolani, & Treble, 2002; Dionne & Dostie, 2007).

Consequently, there are reports indicating that with the implementation of programs that promote worker health and wellbeing, the occurrence of absenteeism is reduced and the productivity of the company is increased (Rabarison et al., 2017).

In context of worker health, it is worth noting the reported relationship between the increase in absenteeism due to illness and cardiovascular risk factors. Among these are: obesity, physical inactivity, hypertension, smoking, diabetes mellitus and dyslipidemia (Gomero et al., 2018; Losina, Yang, Deshpande, Katz, & Collins, 2017; Zarate, 2009). Moreover, the elimination of a cardiovascular risk factor from a worker's profile could reduce more than 2.0% of the occurrence of absenteeism (Pelletier, Boles, & Lynch, 2004).

However, there are discordant reports that indicate the independence of these risk factors with the frequency of

absenteeism due to illness in various groups of workers (Castillo Rascón et al., 2016; Howard & Potter, 2014).

The objective of this study was to analyze sociodemographic characteristics, organizational factors and cardiovascular risk factors, related to work absenteeism in a higher education institution in the city of Cartagena-Colombia.

2. Methods

An analytical cross-sectional study was carried out, with a probabilistic sample of 162 workers of both sexes, belonging to the positions of teachers, operators and administrative staff of a higher education institution in the city of Cartagena-Colombia. All individuals linked as workers were included, who consented to their participation in the study. We excluded those workers who had reported heart disease, trauma with evolution less than two months or acute respiratory compromise.

The sociodemographic data of each individual, personal and family background were recorded and a physical examination was performed, which included the abdominal circumference by using a perimetric tape (II & SB) with pressure control and blood pressure. Size was recorded with digital tallimeter calibrated in centimeters (II & SB, range between 40–600 cm) and weight was measured with Tanita® floor scale (model BC552, Continental Scale Corp., Bridgeview, III, USA) with resolution 0.100 kg. Also, clinical laboratory tests were performed for the analysis of the lipid profile (total cholesterol, HDL cholesterol and triglycerides) and fasting glycemia, determined by enzymatic colorimetric and automated methods (HumaStar 100, Human Diagnostic, USA).

The parameters established by the American Heart Association (AHA) were used to determine the presence of cardiovascular risk factors, which included: waist circumference> 40 inches in men and> 35 inches in women; triglyceride levels> 150 mg / dL; HDL cholesterol <40 mg/dL for men and <50 mg / dL in women; diastolic and systolic blood pressure> 130/80 mmHg, respectively, and fasting blood glucose levels> 100 mg/dL (Kramer, 2015).

The level of physical activity was evaluated using the abbreviated version of the International Physical Activity Questionnaire (IPAQ). For the assessment of absenteeism, we had access to the database of the absenteeism registry of the Human Management Unit of the institution of interest and we identified those absences due to medical disability.

Regarding the data analysis plan, the categorical variables were expressed in proportions and in their respective 95% confidence intervals. For the numerical variables, the measures of central tendency and dispersion were estimated according to the result of the goodness-of-fit test (Shapiro-Wilk test). The Chi-square test of independence was used to identify the statistical associations between variables and, according to the selected cross-sectional design, the prevalence ratio (PR) was estimated. To establish statistically significant differences between two independent groups, we interpreted the 95% confidence intervals of the difference ($CI95\%_{diff}$) between the measures of central tendency used. The estimated p-values were interpreted avoiding the fallacy of statistical significance (Sterne & Smith, 2001), with their respective effect size (Gaskin & Happell, 2014).

All these procedures were performed with the statistical programs IBM® SPSS® Statistics version 23.0 (IBM Corp, Armonk, New York), GraphPad PRISM® version 6.01 (GraphPad software, San Diego, CA), EpiDat 3.1® (General Directorate of Innovation and Xestión da Saúde Pública, Xunta de Galicia, Spain, Pan American Health Organization and Higher Institute of Medical Sciences of Havana).

2.1 Ethical Considerations

According to Resolution No. 8430 of 1993 of the Ministry of Health of Colombia-Article 11, this study corresponded to a research with minimum risk, as it was prospective in nature and the data was recorded through common procedures. This study was reviewed and approved by the Bioethics Committee of the University of San Buenaventura-Cartagena.

3. Results

In this study 162 workers from a private university of the Colombian Caribbean Coast were evaluated, with a predominance of females (108/162, 66.7%, CI95% 59.1% to 73.5%) and with a median for the age of 40 years (IQR : 32.8 to 47.0). The median time of service and seniority of this population corresponded to 6 years (IQR: 2.0 to 13.3) and 7 years (IQR: 2.8 to 16.0), respectively.

The majority of the population under study (120/162, 74.1%, CI95% 66.8% to 80.2%) belonged to the first three socioeconomic strata and with a technical, university or higher educational level (91.4%, 148/162, CI95% 86.0 % to 94.8%).

In this study population, a frequency of absenteeism from work was estimated at 24.7% (40/162, CI95% 18.7% to 31.9%), and a record of multiple absenteeism of 27.5% (11/40, CI95% 16.1% to 42.8%), with a median absence of work of three times during the period evaluated (IQR: 2 to 4 times), being more frequent the occurrence of absenteeism in the age group of 40 to 49 years (37.5%, 15/40 CI95% 24.2% to 53.0%).

Table 1 shows the statistical associations found between work absenteeism and study variables. Regarding the sociodemographic characteristics, we found statistical evidence of a weak association between the socioeconomic stratum and the sex of the worker with the occurrence of work absenteeism. In addition to this, a statistically significant difference was found between women and men in relation to the occurrence of work absenteeism ($CI95\%_{diff}$ 12.3% to 34.9%).

All the organizational variables studied showed a statistical association with work absenteeism. The prevalence of work absenteeism among workers with a position of workers was approximately 3.3 times higher compared to the prevalence estimated in teachers (PR = 3.3, CI95% 1.6 to 7.2). Something similar was found in the comparison of the prevalences of labor absenteeism estimated in workers with administrative position and teachers (PR = 2.3, CI95% 1.1 to 4.7). Added to this, a moderate statistical association was found between the current position of worker and absenteeism.

Although there is evidence of a weak statistical association between work absenteeism and the type of contract of the worker evaluated, accompanied by a statistically significant difference between the frequencies of work absenteeism estimated in workers with an indefinite term contract and a fixed-term contract ($CI95\%_{diff}$ 3.5% to 30.2%).

The weak statistical association found between the absenteeism of work and the time of service of the evaluated worker, was accompanied by the statistically significant difference detected between the median for the time of service among workers with record of absenteeism of those without this type of registration ($CI95\%_{diff}$ 1.0 to 5.0 years; p = 0.006).

The only cardiovascular risk factors that showed statistical association with the occurrence of work absenteeism in the evaluated population were: abdominal obesity and personal history of arterial hypertension. In both situations a weak association was found, additionally, it was estimated that the prevalence of absenteeism in workers with abdominal obesity was approximately 1.8 times higher compared to the estimated prevalence in workers without this risk factor (PR = 1.8 CI95% 1.0 to 3.5). Something similar was found with the personal history of arterial hypertension (PR = 2.1, CI95% 1.1 to 3.9).

Physical activity with vigorous / moderate intensity was weakly associated with the occurrence of absenteeism (p = 0.064, Phi = 0.2), but no difference between the estimated prevalence ratios among workers with vigorous/ moderate intensity compared to those with high intensity. mild physical activity (PR = 0.6, ICI95% 0.3 to 1.1).

Table 1. Sociodemographic characteristics, organizational factors, and cardiovascular risk factors related to employee absenteeism in Colombian higher education institution, 2017

Study variables	**Absenteeism Yes (n=40)**	**Absenteeism No (n=122)**	**p-value**	**Effect size**
Age (years)	42 (IQR: 37 to 48)	39 (IQR: 25 to 75)	0.289	
Sex				
Male	5	49	0.001	Phi=0.3
Female	35	73		
Marital status				
Single	7	35		
Married	15	52		
Divorced	5	6	0.379	
Widow(er)	1	4		
Consensual union	10	18		

Socioeconomic status				
Low	34	86		
Medium	2	26	0.062	Phi=0.3
High	4	10		
Work type job				
Teachers	9	60		
Administrative support workers	21	49	0.006	Phi=0.4
Operatives	10	13		
Seniority (years)	8 (IQR: 5 to 15)	4 (IQR: 2 to 13)	0.006	Rosenthal r=0.2
Types of contracts				
Fixed-term	15	72	0.013	Phi=0.2
Undefined-term	25	48		
CRF				
Hyperglycemia	2	4	0.986	
Hypercholesterolemia	4	12	0.783	
Low HDL cholesterol	7	23	0.887	
Hypertriglyceridemia	9	28	0.953	
BMI				
Normal weight	10	48		
Overweight	22	58	0.135	
Obese	8	13		
Waist circumference				
Normal	10	51	0.05	Phi=0.2
High	30	70		
Level of physical activity				
Light	30	71	0.07	Phi=0.2
Moderate/vigorous	10	50		
Personal history of HTA	7	8	0.04	Phi=0.2
High blood pressure	3	23	0.10	

IQR: interquartile range; CRF: cardiovascular risk factor; BMI: body mass index; HTA: hypertension.

4. Discussion

The importance of the economic costs generated by absenteeism due to medical reasons is recognized, in terms of loss of productivity and quality of work (Asfaw, 2014; Bankert, 2015).

This study reports a lower frequency of work absenteeism than those published in other Colombian populations, such as metal-mechanic industry workers (Agredo Zúñiga et al., 2013), agroindustrial sector workers (Arias-Moreno, Carvajal, & Cruz, 2015), in administrative and assistance staff of a forensic institution (Escobar-Aramburo et al., 2015), in workers of the operating area of a mineral extraction company (Vásquez Trespalacios, 2013) and in operators of a public mass transport company (Mosquera Navarro, Ordoñez Cubides, & Grajales, 2016), but it is higher than the frequency reported in workers of a Health Promoting Company (Martinez-Lopez & Saldarriaga-Franco, 2008).

Among the possible explanations for the disparity observed in the behavior of the occurrence of absenteeism in the various groups of workers mentioned above, are: (I) underreporting of reports of medical disability or other types of absenteeism, as a consequence of a poor system of management (Stock et al., 2014); (II) the culture of absence

in the company, (III) different expectations of the worker and (IV) the multifactorial characteristic of labor absenteeism (Sanchez, 2013; Vásquez Trespalacios, 2013).

The frequency of work absenteeism estimated in this study was higher in women than in men, which is the result of the evidence obtained in predictive studies (Barmby et al., 2002; Dionne & Dostie, 2007). In part, this behavior could be explained by the different social obligations assigned to these individuals (Barmby et al., 2002).

As for the organizational factors, in the group of workers with the hiring of an indefinite term, an occurrence of higher absenteeism was estimated than workers with a fixed-term contract, with more than three percentage points of difference between them. Several authors state that the type of contracting establishes the highest or lowest degree of commitment, satisfaction and welfare related to work absenteeism. In other words, from the perception of the worker, he considers that the elderly with a fixed charge (Coluccio Piñones, 2016; Sanz, 2017).

In coherence with the results found, some investigations show that excess weight is one of the risk factors with greater predominance in the other types (Agredo Zúñiga et al., 2013; Manzano & López Hernández, 2017; Orozco-González, Cortés- Sanabria, Viera-Franco, Ramírez-Márquez, & Cueto-Manzano, 2016; Puescas Sánchez, Cabrera Enríquez, & Díaz Vélez, 2012).

On the other hand, no statistical association could be found between the occurrence of work absenteeism and the cardiovascular risk factors studied, except for the personal history of hypertension, since the prevalence of absenteeism was approximately two times higher in workers with a personal history. Of hypertension compared to those who did not present this type of personal history.

Other investigations give support to these results with their findings (Castillo Rascón et al., 2016; Ruiz de la Fuente Tirado et al., 1992), which indicate a higher frequency of absenteeism due to illness in hypertensive workers compared to normotensive. Moreover, since the 1980s, hypertension has been recognized as one of the determinants of work absenteeism (Sexton & Schumann, 1985).

Obesity in workers affects their production capacity and daily performance (Rodbard, Fox, & Grandy, 2009), resulting in high direct and indirect costs for the company (Højgaard, Olsen, Søgaard, Sørensen, & Gyrd-Hansen, 2008), so much so that it is considered that the annual costs derived from medical expenses and absenteeism in obese workers reach up to 45 billion dollars (Klonoff, 2009).

There is evidence that indicates that abdominal obesity acts as an independent predictor of work absenteeism, unlike obesity determined by body mass index (Moreau et al., 2004), but even this is discordance (Jans, van den Heuvel , Hildebrandt, & Bongers, 2007).

Also was found a weak association between absenteeism and abdominal obesity in the population of workers evaluated. This statistical relationship has been previously reported in Colombian workers (Agredo Zúñiga et al., 2013) and in European workers (Fitzgerald, Kirby, Murphy, & Geaney, 2016; Korpela et al., 2013; Moreau et al., 2004).

Within this context, five possible conceptual models of interaction between obesity, exposure at the workplace and illness have been stated: (I) obesity can modify the causal relationship between occupational exposure and a specific illness; (II) obesity and occupational exposure act as independent risk factors, but additives for the development of a specific disease; (III) work as a source of adverse environmental exposures and promoter of obesity, which in combination or independently can modify the risk of occurrence of a specific disease; (IV) occupational exposure can modify the causal relationship between obesity and a certain disease and (V) obesity and occupational exposure can trigger two different diseases, which can interact (Schulte et al., 2007).

Some of these conceptual models can be supported by evidence indicating that the behavior over time of abdominal obesity can be influenced by the application of job enrichment as a motivational strategy for change (Fried et al., 2013).

In this group of workers, no relationship was found between absenteeism and other cardiovascular risk factors, such as hypercholesterolemia and obesity, similar to that reported in public employees (Castillo Rascón et al., 2016), but different from that reported by other authors (Leynen et al., 2006).

In relation to the evaluation of physical activity through the IPAQ, no differences were observed between the prevalence of work absenteeism estimated between the two categories of intensity of physical activity studied (vigorous / moderate vs. mild). Mild physical activity has been negatively associated with absenteeism, only when accompanied by the consumption of a diet of high nutritional quality (Fitzgerald et al., 2016).

It is important to highlight the proven impact of lifestyle programs and healthy work, of immediate application, in terms of a sustained reduction in the worker's body weight and certain cardiovascular risk factors (Dallam & Foust,

2013; Daubert, Ferko-Adams, Rheinheimer, & Brecht, 2012; Kramer, 2015).

Beyond the limitations derived from the cross-sectional design used, the evidences found in this probabilistic test for workers imply the need to implement, immediately, a lifestyle and healthy work change program that fits a motivational strategy change, such as the enrichment of the job, but recognizing the different barriers to participation related to work, for the reduction of working time, the occurrence of work absenteeism and the prevalence of cardiovascular risk factors found in the study population .

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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