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Original Article

QUALITY OF LIFE, SOCIOECONOMIC, DEMOGRAPHIC AND LABOR PROFILE OF SOLID WASTE COLLECTORS

QUALIDADE DE VIDA, PERFIL SOCIOECONÔMICO, DEMOGRÁFICO E LABORAL DE COLETORES DE RESÍDUOS SÓLIDOS

CALIDAD DE VIDA, PERFIL SOCIOECONÓMICO, DEMOGRÁFICO Y LABORAL DE COLECTORES DE RESIDUOS SÓLIDOS

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Objective: to evaluate the quality of life and the socioeconomic, demographic and labor profile of solid waste collectors. Method: quantitative and transversal study conducted with 43 waste collectors in the period from February to June 2015. A form with socioeconomic, demographic and labor data and the WHOQOL-Bref questionnaire were used. Results: all respondents were male, with a mean age of 33.6 years, 37.2% had incomplete high school and a time of 3.83 years on average working as collectors. As for health conditions, 55.8% had experienced musculoskeletal pain after starting to work as collectors and 93% reported being satisfied or very satisfied with their health. On the quality of life, personal relationships domain had better valuation (81.8) and environment, the worst valuation (61.1). Conclusion: despite the adverse conditions and long working hours, the overall quality of life had a good average (81.7 ± 13.2).

Descriptors: Solid Waste; Worker's Health; Work Accidents; Quality of Life.

Objetivo: avaliar a qualidade de vida, o perfil socioeconômico, demográfico e laboral de coletores de resíduos sólidos. Método: estudo quantitativo, transversal, realizado com 43 coletores de resíduos no período de fevereiro a junho de 2015. Utilizou-se formulário contendo dados socioeconômicos, demográficos, laborais e o questionário WHOQOL-Bref. Resultados: todos os entrevistados eram do sexo masculino, com média de idade de 33,6 anos, 37,2% possuíam segundo grau incompleto, tempo médio como coletor 3,83 anos. Quanto às condições de saúde, 55,8% apresentaram dor musculoesquelética após terem se iniciado na função de coletor e 93% informaram estar satisfeitos ou muito satisfeitos com sua saúde. Sobre a qualidade de vida, o domínio de relações pessoais apresentou melhor valoração (81,8) e o meio ambiente a pior (61,1). Conclusão: apesar das condições de trabalho adversas e da extensa carga horária, a qualidade de vida geral teve uma boa média (81,7±13,2).

Descritores: Resíduos Sólidos; Saúde do Trabalhador; Acidentes de Trabalho; Qualidade de Vida.

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Objetivo: evaluar la calidad de vida, el perfil socioeconómico, demográfico y laboral de los colectores de residuos sólidos. Método: estudio cuantitativo, transversal, realizado con 43 participantes entre febrero y junio de 2015. Se utilizó un formulario con datos socioeconómicos, demográficos, laborales y el cuestionario WHOQOL-Bref. Resultados: todos los encuestados eran hombres, con edad media de 33,6 años. El 37,2% había completado la escuela secundaria, el tiempo medio como colector fue 3,83 años. En cuanto a la salud, el 55,8% tenían dolor musculoesquelético después de haber comenzado la función de colector y el 93% reportó estar satisfechos o muy satisfechos con su salud. Sobre la calidad de vida, el dominio de relaciones personales tuvo una mejor valoración (81.8) y el medio ambiente el peor (61,1). Conclusión: a pesar de las condiciones de trabajo adversas y de las largas horas, el ítem calidad de vida tuvo un buen promedio (81,7 ± 13,2).

Descriptores: Residuos Sólidos; Salud del Trabajador; Accidentes de Trabajo; Calidad de Vida.

Introduction

Population growth in recent decades has been followed by the accumulation of solid waste as result of increased industrial production and over-consumption. The irregular disposal of this waste has become a serious urban problem, generating trouble related to public sanitation and environmental contamination[1]. There is currently a large number of people working with waste collection, and by doing this, they expose themselves to various chemical and biological factors considered facilitators of occupational health problems[2]. By putting away household and commercial garbage, waste collectors are considered responsible for an essential public service to environmental preservation and, hence, to public health[3]. Garbage collection is a dynamic process and includes aspects worthy of analysis and intervention. This is because, during the workday, these workers walk, run, go up and down the streets, raise different weights, withstand sun, rain, cold and abrupt temperature changes. Thus, it is observed that occupational health of that specific professional category, i.e. the relationship between work and health/disease processes, presents aspects that are amenable to study and intervention in the context of public health[4].

In recent years, quality of life (QOL) has been used as a useful construct to study occupational health and serves to evaluate the relationship between diseases and quality of life at work[5]. The World Health Organization (WHO) defines quality of life as the perception that individuals have about their position in life in relation to culture and to values they live, and regarding their goals, expectations, standards and concerns[6].

The profile of QOL in contemporary times has been centered on individuals and the inconsistencies that surround them. The individual is the one who can give the correct answers to evaluate the own QOL profile[7]. Work can have a satisfactory or unsatisfactory effect on the individual's health and may cause dissatisfaction, suffering, depreciation, physical fatigue and emotional stress[8].

In order to analyze the QOL, it is necessary to take into account its operational dimension and its epistemological bases. It is recommended that concepts such as universality, individuality and autonomy, quite common in evaluations of QOL, be used with caution[9]. The present study is justified by the fact that the category of waste collectors is directly exposed to various risks that may cause harm to occupational health.

In this perspective, the present study aims to evaluate the quality of life and the socioeconomic, demographic and labor profile of solid waste collectors.

Method

Quantitative, cross-sectional, descriptive and analytical study carried out with solid waste collectors of an outsourced company in Divinópolis (MG), Brazil. The city has a population of approximately 213,000 inhabitants[10] and produces about 150 tons of waste/day and 4,500 tons per month, including commercial

and urban waste. The Viasolo Company collects household waste in rural and urban areas, as well as commercial and medical waste, performs the processing of medical waste and is responsible for the implementation and operation of landfills and selective collection.

The study was approved by the Ethics Committee on Research with Human Beings of the Federal University of São João del Rei, Midwest *campus* - Dona Lindu (CEPES/CCO), under Opinion nº 846 156 in accordance with Resolution nº 466/2012 of the National Health Council[11]. As inclusion criteria, worker should not be away from work or on leave in the day of data collection, which occurred in the period from February to July 2015.

A total of 47 workers were found during the period of data collection. Among these, 43 were active, two were unable to participate because they were not active, and two were on vacations. Thus, the sample consisted of 43 collectors. A questionnaire addressing socio-economic, demographic and labor aspects was used to characterize the profile of these workers. The questionnaire had 62 questions related to schooling, age, marital status, housing characteristics, income, work characteristics and health changes.

The WHOQOL-Bref questionnaire established by WHO in 1998[12] and translated and validated for the Brazilian reality[13] was used to analyze the QOL. The WHOQOL-Bref is a short instrument that requires little time to be filled out and is based on the assumption that QOL is a subjective and multi-dimensional construct on the perception of the individual, and consists of both positive and negative dimensions. This instrument originated from the WHOQOL-100, which contains 100 questions distributed into six dimensions or domains: physical, psychological, level of independence, social relationships, environment, and spirituality/religiosity/personal beliefs[13]. The short instrument consists of 26 questions. Two are general questions: the first refers to the overall quality of life; and the second refers to the satisfaction of the individual regarding the own health. The remaining 24 questions assess aspects of the physical, psychological, social relationships and environment domains[13]. The 26 questions that make up the WHOQOL-Bref are formed by scales with 5 *Likert*-type answer, including intensity (none to extremely), frequency (never to always), capacity (nothing to completely) and evaluation (very dissatisfied to very satisfied; very bad to very good) scales[13]. In the WHOQOL-100, each facet is evaluated through four questions while in the WHOQOL-Bref, through a single question[13]. To calculate the scores of domains, we used the method proposed by the WHOQOL Group[12] and validated in Brazil[13].

Questionnaires were applied by one of the researchers in the residence of each collector and after prior communication and telephone scheduling. In addition to the questionnaires, anthropometric data were measured, namely, weight and height[14], body mass index (BMI) [15], abdominal circumference[16] and vital signs such as blood pressure[17], heart rate, respiratory rate and axillary temperature[14]. During data collection, when an abnormality was detected, the researcher guided the collector to seek care in the health unit.

Data were tabulated in an electronic spreadsheet in Microsoft Excel version 2013 using double entry technique and later exported to the *Statistical Package for Social Science* (SPSS) *software* version 20.0. Descriptive analysis was performed and results of frequency distribution for categorical variables and measures of central tendency, position and dispersion for numerical variables are presented in tables.

Results

The 43 workers evaluated were male. Regarding marital status, 41.9% reported to live in common law marriage and 27.9% were married; the average age was about 33.6 years (SD ± 9.2). The Cronbach's alpha value of the overall quality of life was 0.719. Table 1 shows the socioeconomic, demographic and labor data of waste collectors.

Table 1 – Number and percentage of socioeconomic, demographic and labor variables of solid waste collectors. Divinópolis, Minas Gerais, Brazil, 2015. (N = 43)

Variables	n	Percentage
Gender		
Male	43	100.0
Age		
Mean ± standard deviation	33.6 ± 9.2	
Marital Status		
Single	11	25.6
Married	12	27.9
Divorced	2	4.7
Common law marriage	18	41.9
Children		
No	9	20.9
Yes	34	79.1
Schooling		
Incomplete 1st to 4th grade	6	14.0
Complete 1st to 4th grade	5	11.6
Incomplete 5th to 8th grade	11	25.6
Complete 5th to 8th grade	1	2.3
Incomplete high school	16	37.2
Complete high school	4	9.3
Age at the start of working life		
Mean ± standard deviation	13.7 ± 3.1	
Time working as collector (months)		
Mean ± standard deviation	46.3 ± 61.0	
Weekly working hours (including overtime)		
44 h	3	6.9
46 h	2	4.7
48 h	4	9.3
50 h	16	37.2
52 h	18	41.9
Income		
One minimum wage	13	30.2
One minimum wage and a half	27	62.8
Two minimum wages	3	7.0
Work accident		
No	32	74.4
Yes	11	25.6
Commuting accident		
No	38	88.4
Yes	5	11.6
Satisfaction with the work		
No	1	2.3
Yes	42	97.7
Total	43	100

Source: Created by the authors.

As for the QOL of collectors, Table 2 shows the mean, median, standard deviation and maximum and minimum values of each domain of the QOL and overall QOL index.

Table 2 – Mean, median and minimum and maximum standard deviations of quality of life domains of solid waste collectors. Divinópolis, Minas Gerais, Brazil, 2015. (N = 43)

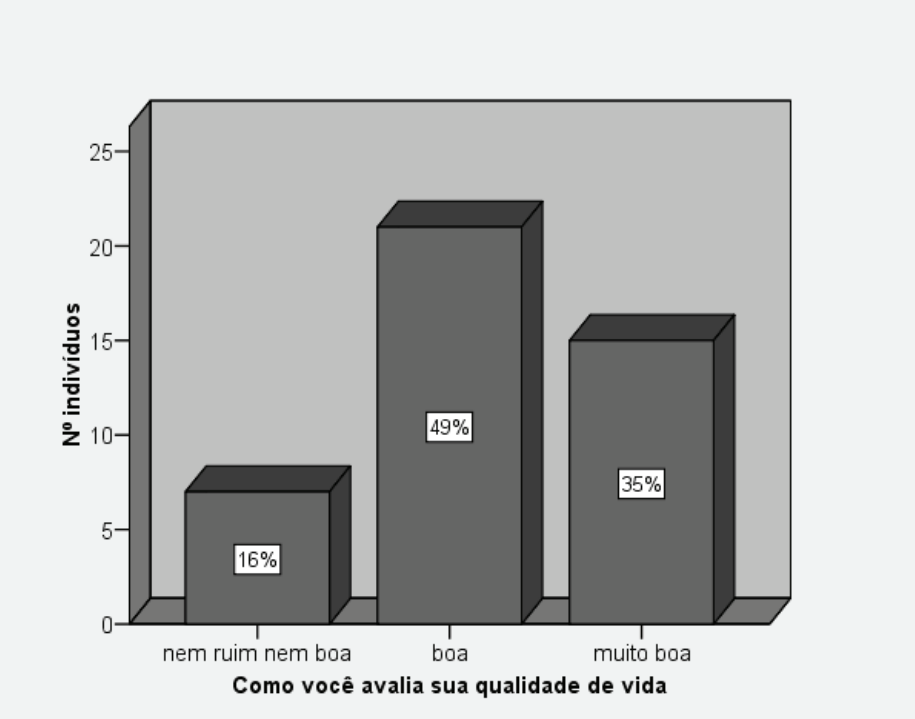
Mean, Median, Standard deviation	Physical domain	Psychological domain	Social relationships	Environment	Overall quality of life index
Mean	63.0	68.7	81.8	61.1	81.7
Median	60.7	66.7	83.3	59.4	87.5
Standard deviation	10.3	11.1	16.4	13.4	13.2
Minimum	42.9	50.0	41.7	34.4	50.0
Maximum	96.4	100.0	100.0	90.6	100.0

Source: Created by the authors.

To assess the overall QOL and satisfaction with their own health, two questions were applied, according to questions 1 and 2 of the WOQOL-Bref questionnaire, as follows: Question 1. How do you evaluate your quality of life? Question 2. How satisfied are you with your health?

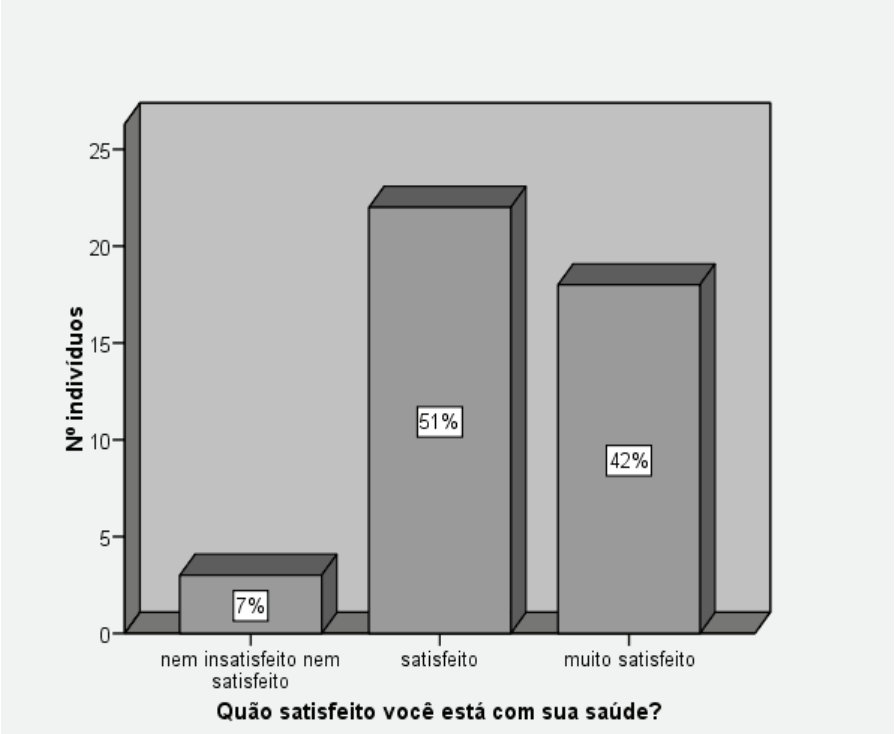
Figures 1 and 2 show the relative frequency of how solid waste collectors evaluated their own quality of life and satisfaction with health.

Figure 1 – Self-assessment of solid waste collectors as to the quality of life. Divinópolis, Minas Gerais, Brazil, 2015. (N = 43)



Source: Created by the authors.

Figure 2 – Self-assessment of solid waste collectors as to satisfaction with health. Divinópolis, Minas Gerais, Brazil, 2015. (N = 43)



Source: Created by the authors.

Table 3 shows the correlation between WHOQOL-Bref domains and WHOQOL-Bref scale overall score of collectors.

Table 3 – Correlation coefficient between the different domains and the WHOQOL-Bref scale overall score of waste collectors. Divinópolis, Minas Gerais, Brazil, 2015. (N = 43)

Domains		Physical domain	Psychological domain	Personal relationships	Environment	Overall index
Physical domain	Correlation*					
	P-value	.				
Psychological domain	Correlation*	0.169				
	P-value	0.280	.			
Personal relationships	Correlation*	**0.418**	**0.386**			
	P-value	**0.005**	**0.011**	.		
Environment	Correlation*	0.219	0.221	**0.503**		
	P-value	0.158	0.154	**0.001**	.	
Overall index	Correlation*	0.273	0.144	0.203	0.271	
	P-value	0.077	0.358	0.193	0.078	.

Source: Created by the authors.

* Spearman's correlation coefficient.

There was a significant correlation between personal relationships and the other domains (physical, psychological and environmental), according to the Spearman test whose results are presented in the Table 3. The overall index did not correlate significantly with any of the domains.

Table 4 shows the descriptive analysis of health conditions of solid waste collectors.

Table 4 – Frequency and percentage of health variables of solid waste collectors. Divinópolis, Minas Gerais, Brazil, 2015. (N = 43)

Variables	Frequency	Percentage (%)
Body Mass Index (BMI)		
<18.5 kg/m^2 (low weight)	2	4.7
18.5 to 24.9 kg/m^2 (eutrophic)	32	74.4
≥ 25 kg/m^2 (overweight)	8	18.6
30.0 to 34.9 kg/m^2 (obese I)	1	2.3
Abdominal Circumference (AC)		
Normal (<94)	38	88.4
Increased (> = 94)	5	11.6
Blood Pressure (>= 140/90 mmHg)		
No	32	74.4
Yes	11	25.6
Musculoskeletal pain		
No	19	44.2
Yes	24	55.8
Region affected by the pain		
Limbs	10	23.2
Spine	12	27.9
Others	2	4.6
No pain	19	44.2
Total	43	100

Source: Created by the authors.

Discussion

The profile of waste collectors participating in this research is in line with a study carried out with garbage collectors in the southern region of the country in which all respondents were male, aged 26.2 years (± 5.4 SD) on average, 70.1% married or living with a partner and had 6.2 years (± 2.33 SD) of schooling[3]. These results confirm that the majority of workers performing the function of waste collectors in Brazil are men in productive age. This can be explained by intense physical force necessary during the working day and the physical wear implied by it.

As for the time exercising the function, a survey with garbage collectors in two cities of Southern Brazil found that 38.6% collectors had been working in this function for 1 to 12 months; 29.9% for 13 to 60 months; 17.3% for less than 1 month; and 14.2% for more than 60 months (median 8.5 months). Thus, 56% of subjects had been working as collectors for less than one year[18]. This work has usually high turnover of individuals, something that was also identified in the present study by the permanence of 3.8 years on average in the function.

The workload of waste collectors in the present study varied from 44 hours per week divided into two shifts, the first shift starting at 7 hours and ending at 15 hours and 20 minutes and the second starting round 18 hours until 1 hour and 20 minutes of the next day, six days a

week. Additionally, overtime work is practiced, depending on the need of service. At the end, the workload of most workers accounts for 52 hours a week. Of this total, 44.2% of collectors worked in the night shift. According to the Consolidation of Labor Laws (CLT), in its Article 73, paragraph 2, the "night shift" refers to the work performed between 22 hours of a given day and 5 hours of the next day[19].

As for monthly income, 62.8% respondents reported receiving one minimum wage and a half in this study. A research carried out with waste collectors also identified the average monthly income of two minimum wages[20]. These results show the low wage values paid to this professional category in Brazil.

Among respondents, 26.2% had experienced Work Accidents (WA). Among these, 81.8% were related to the lower limbs (legs and feet) with injuries caused by cutting, torsion and fracture; 18.2% occurred in the upper limbs, specifically hand injuries caused by cuts and burns. In relation to commuting accidents, 11.6% have had accidents. Of these, 75% had suffered motorcycle accidents and 25%, bicycle fall. The most common means of transportation used to go to work was bus (58.1%), as the majority of them do not own a vehicle.

Precarious working conditions of these workers were noted in the sense that they are always in direct contact with contaminated and sharp objects such as syringes and glasses. This contributes to the occurrence of diseases and WA[21].

A study carried out to identify possible risk factors related to WA among collectors reported that these workers are exposed to dust, noise, cold, heat, smoke, carbon monoxide, as well as they have to practice forced and uncomfortable postures and, moreover, still pathogenic microorganisms. Most accidents consisted in cuts, bruises, fractures and joint injuries. The main causes of accidents identified were related to the lack of attention to work, failure to follow the rules and safety procedures, absence of personal protective equipment (PPE) and bad shape of machines and equipment used at work[20].

There are some other important factors that may contribute to the occurrence of injuries, such as dog bites, pedestrian accidents, and exposure to the sun. The PPE may not always fully protect workers from the risks they are exposed to in their daily activities, as they are designed to only against certain vulnerabilities, not to mention that the uniform itself can cause discomforts such as rashes on the skin due to the reflective material of shirts[22].

Among the domains of the WHOQOL-Bref questionnaire, social relations domain was the one that had the highest mean score (81.8 ± 16.4). This domain assesses the quality of interpersonal relationships, encompassing aspects such as satisfaction with personal relationships, sexual activity and social support from close people[23]. In general, the waste collectors studied valued social relationships with family members, with the public and with co-workers. Because work routes are fixed, they made possible the creation of link between collectors and the population during the execution of the work. This contributed to the success of relationships, especially in the suburbs.

The psychological domain had a score of 68.7 ± 11. This domain comprises positive feelings, thinking, learning, memory and concentration, self-esteem, body image and appearance, negative feelings, spirituality, religion and personal beliefs[13].

The physical domain, related to physical pain, energy for day to day activities, mobility, sleep and performance of daily activities, was other domain that had low average score (63.0 ± 10.3)[24].

In this study, the environment domain had the lowest average (61.1 ± 13.4). This domain includes physical security and protection, the environment where the person lives, financial resources, access to health and social care services, availability of information, recreation and leisure opportunities, physical environment (traffic, climate, pollution) and means of transportation[12].

Studies with different professional categories, such as motorcycle taxi drivers[25], nursing

technicians, nurses, psychologists, nutritionists, social workers, physicians and physiotherapists[23] have shown that the domain with highest score is also social relations, and the one with lowest score is the environment domain[23,26].

In a study conducted in China, the environment domain had the lowest score[27], demonstrating the interference of the environments in which these workers live and frequently visit on their quality of life.

Collectors perform their activities in outdoor conditions, exposed to rain, cold, heat. Besides these factors, there is violence in certain places where the collection is held[28]. The work is performed on hills and in streets with precarious pavement, leaving workers exposed to trepidation while they travel in the backside riding step of the collector vehicle. While performing the task, they still have to go up and down hills, covering kilometers on foot at times that often coincide with intense traffic, what may prompt casualties such as collisions and pedestrian accidents[29]. Besides all these aggravating factors, the work is still attached to prejudice and stereotypes. Because this work deals with waste, it is considered miserable by society[30].

Nevertheless, the overall quality of life in the research conducted had an average of 81.7 ± 13.2 and concerns two general issues on quality of life: How would you evaluate your quality of life? How satisfied are you with your health? Similar results have been found in a research conducted with 49 male soldiers who entered the military force, in a battalion of Ponta Grossa (PR) in the year 2012, in which the authors found that 63.26% participants considered their QOL good; 20.40% considered it very good; 14.29%, neither bad nor good; and 2.05% considered it bad. In this study, very bad QOL was not reported[31].

The self-assessment of the subjective perception of the QOL of 110 male and female anesthesiologists in the city of Recife (PE) showed that 9.1% considered it as very good; 46.4% considered it good; 28.2%, neither good nor bad; and 16.4%, bad or very bad[32].

The results of this survey are in line with a research conducted with 18 officers and 33 sergeants of Cruz Alta artillery group (RS) whose objective was to analyze their perception of QOL; 27 (52.9%) considered it good; 20 (39.2%), very good; and four (8.9%), neither bad nor good[33].

Study with 69 physical education teachers in a municipal teaching institution of Campo Grande (MS) showed that 56.5% considered their QOL good; 11.6%, very good; 26.1%, neither bad nor good; 4.3%, bad; and 1.4%, very bad[34].

The search for QOL in any profession is of paramount importance for the worker's life, as it seeks to bring benefits and provide better physical and psychological conditions for individuals in the exercise of their profession[35]. Furthermore, a good quality of working life has great influence on the self-esteem of workers, which can consequently have a positive effect on their productivity[36].

The second question addressed in the WHOQOL-Bref questionnaire on satisfaction with health showed that the majority (51%) were satisfied and 42% very satisfied with their health, while 7% said neither be dissatisfied nor satisfied with their health. None of the respondents stated dissatisfaction or a strong dissatisfaction with health.

Research conducted with 110 anesthesiologists in the city of Recife (PE), found that 9.1% evaluated in as very good; 46.4% as good; 28.2%, neither good nor bad; and 16.4%, bad or very bad. As for the degree of satisfaction with health, 48.2% are satisfied; 20.9% dissatisfied; 16.4%, either satisfied or dissatisfied; 1.8%, very dissatisfied; and only 12.7% are very satisfied[32].

In relation to health, the present study showed that the BMI was considered to be within the normal range in the case of 74.4% of the collectors. Another study conducted also with solid waste collectors found normal BMI in more than 75% of workers[3].

When participants were asked about presence of musculoskeletal pain in any body part after starting this kind of work, 55.2% reported that they had experienced such change. This information corroborates a study carried out

with collectors which also found high levels of pain or musculoskeletal discomfort after starting this work (88.2%)[3].

Blood pressure, in this study, was measured only once. The values found were higher or equal to 140/90 mmHg in 25.6% of participants. No participant was enrolled in any outpatient control or used medications to control blood pressure, since they did not even know they had abnormal blood pressure values. These workers did not have corporative health insurance plan; hence, all reported to use the Unified Health System (SUS) when needed.

The WHO[15] sets the AC value equal to or above 94 cm in men and 80 cm in women as cutoff point for increased cardiovascular risk. Abdominal circumference values were found above normal in 11.6% of collectors, despite the work they do. Regarding eating habits, which represent factors that may interfere with this circumference, 44.2% collectors in this study usually had only one meal during the working day and 39.5%, two meals, without fixed local or times for eating.

These values can be justified by the fact that the work of collecting waste is exhausting and these eating habits without correct orientation are, in most cases, inadequate for the everyday energy expenditure. Thus the body composition and physical preparation of these workers play an important role[37].

As study limitation, we highlight the small number of collectors. However, the results showed to be similar to those described in the literature in relation to socioeconomic, cultural and labor characteristics.

Conclusion

This study showed that, the all the 43 solid waste collectors interviewed were male, aged 33.6 years on average, 69.8% were married or living in a common law marriage, and 79.1% had children. Only 9.3% participants had completed high school, 34.9% had their own house and 62.8% earned on average one minimum wage and a half.

Regarding the characteristics of the work, on average, collectors began working at the age of 13.7 years, the time working as collectors was 3 years and eight months, 93.1% of them had a workload above 44 weekly hours besides overtime, totaling 52 weekly hours. Among the workers studied, 26.2% had experienced WA and 11.6% had suffered commuting accidents. The satisfaction with the work was reported by 97.7% of them.

Regarding quality of life, the overall index score was 81.7. Among the domains, social relationships had the highest average score, 81.8, and the environment domain had the lowest, 61.1. When performing the correlation between the domains of the WHOQOL-Bref through Spearman's tests, it was found that there was significant correlation between personal relationships and all other domains.

The analysis of health conditions showed that 55.8% of respondents had musculoskeletal pain after starting to act as waste collectors, and lombalgy was the most cited. As for blood pressure, 25.6% had BP above or equal to 140/90 mmHg at the time of interview, and 18.6% had BMI classified as overweight.

The results showed that collectors had positive evaluations of the quality of life and job satisfaction. However, it is important to point out that the government and health professionals should carry out interventions aimed at Occupational Health, and implement actions aimed at health promotion and prevention of diseases and disorders. As for the collection companies, it is necessary to conduct continuing education, offer sufficient PPE and demand its correct use in order to promote a safer, healthier and qualified work environment.

Finally, we emphasize the importance of correctly packaging waste, something to be practiced by the entire population in order to prevent accidents among waste collectors, as they carry out the collection of waste from households, businesses and healthcare institutions.

Collaboration:

1. conception, design, analysis and interpretation of data: Flávia Mendes da Silva and Renata Cristina da Penha Silveira;

2. writing of the article and relevant critical review of the intellectual content: Flávia Mendes da Silva, Renata Cristina da Penha Silveira and Paulo Henrique Alves de Sousa;

3. final approval of the version to be published: Renata Cristina da Penha Silveira, Maria Lúcia do Carmo Cruz Robazzi and Luciana Regina Ferreira da Mata.

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