Longitudinal evaluation of the quality of life of smoking motorcycle taxi drivers

Avaliação longitudinal da qualidade de vida entre mototaxistas tabagistas

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ABSTRACT | Background: The quality of life (QoL) of traffic and transit workers has been a focus of much attention; motorcyclists are the workers most susceptible to accidents and exposure to pollutants. These factors added to smoking might result in respiratory disorders and influence the workers' QoL. **Objective:** To analyze the QoL of smoking or not motorcycle taxi drivers. **Method:** Longitudinal and epidemiological study with quantitative approach conducted with 95 motorcycle taxi drivers from Jatai, southeastern Goias, Brazil, in two stages in 2014 and 2015. We administered a questionnaire to collect sociodemographic and occupational data and self-perceived state of health, and WHOQOL-BREF. Statistical analysis was performed with software Statistical Package for Social Sciences® and STATA®; the significance level was set to p<0.05. **Results:** Most participants were male (98.9%), nonsmokers (89.5%), had already suffered work accidents (67.4%); their average age was 39.1 years old, and 48.5% described their state of health as good. The score on the physical health domain of QoL decreased (from 86.07 to 74.28; p=0.091) and the one on the environment domain increased (from 58.43 to 64.06; p=0.285) among smokers. Also among nonsmokers the score on domain physical health decreased (from 79.87 to 76.38; p=0.014) and the one on domain environment increased (from 58.27 to 67.32; p<0.001). We found association of age and smoking with QoL domain physical health (p=0.014; 0.027). **Conclusion:** Motorcycle taxi drivers are exposed to several factors which might influence their living and working conditions. New public health policies targeting this population of workers are needed.

Keywords | tobacco use disorder; occupational health; quality of life; public health; motorcycles.

RESUMO | Introdução: A qualidade de vida (QV) de trabalhadores do trânsito tem sido foco de atenção, sendo os motociclistas os mais susceptíveis a acidentes e exposição a poluentes. Esses fatores, somados à prática tabagista, podem gerar transtornos respiratórios e influenciar na QV do trabalhador. **Objetivo:** Avaliar a qualidade de vida de mototaxistas tabagistas e não tabagistas. **Método:** Estudo longitudinal e epidemiológico, de abordagem quantitativa, desenvolvido com 95 mototaxistas de Jataí, no sudoeste goiano, Brasil, realizado em duas etapas entre 2014 e 2015, utilizando um questionário para avaliar características sociodemográficas e ocupacionais e percepção da saúde dos mototaxistas e o questionário WHOQOL-Bref. Os dados foram analisados nos programas Statistical Package for Social Sciences® e STATA®, por meio de testes estatísticos, considerando os valores de p<0,05 significantes. **Resultados:** A maioria era do sexo masculino (98,9%), não fumava (89,5%), já havia se acidentado (67,4%); a idade média era de 39,1 anos, e 48,5% deles tinham boa percepção de saúde. O escore de domínio físico reduziu (86,07 versus 74,28; p=0,091) e o escore do domínio ambiental aumentou (58,43 versus 64,06; *p*=0,285) entre tabagistas. Entre os não tagagistas, o escore do do domínio físico reduziu (79,87 *versus* 76,38; *p*=0,014) e do domínio ambiental aumentou (58,27 *versus* 67,32; *p*<0,001). Houve associação entre a idade e o uso de tabaco com a QV no domínio físico (p=0,014; 0,027). **Conclusão:** Os mototaxistas estão expostos a diversos fatores que podem influenciar sua condição de vida e seu trabalho, tornando necessária a adoção de novas políticas públicas de saúde com vistas a essa classe trabalhadora.

Palavras-chave | tabagismo; saúde do trabalhador; qualidade de vida; saúde pública; motocicletas.

INTRODUCTION

Quality of life (QoL), considered as a set of characteristics which contribute to the well-being of people, is a notion peculiar to each individual or group concerning their self-perceived well-being. QoL depends on several factors proper to the singular needs of each population, including factors related to health, leisure, longevity, work, family and social relationships, and spirituality, among others[1].

QoL has been associated to moments in the lives of individuals within society, and also to work[2]. However, it is not possible to dissociate life and work, or to pass over the influence of work on QoL. This fact led to discussions on QoL at work[3]. Within this context, we call the attention to traffic and transit workers, including the ones who drive motorcycles to transport freight or people.

Compared to cars, motorcycles are a potentially more sustainable mode of transport, as they demand less room, consume less resources and pollute less[4]. A study conducted in Colombian, Brazilian, Venezuelan and Argentinian counties found that use of motorcycles increased in Latin America. Reasons for such increase in cities were time advantages, low cost, poor public transportation and heavy traffic. However, another relevant finding was the vulnerability of motorcyclists to traffic, death and cultural aspects related to the use of motorcycles[5].

In Brazil, motorcycle taxi drivers belong with the informal labor market, and represent a category of workers whose goal is to contribute to ease the chaotic situation of public transport especially in large cities[6]. They work outdoors and are continuously exposed to traffic-related hazards, such as vehicle overcrowding, accidents, high air pollution levels, thefts, assaults and high temperatures, among others[6].

In addition to the environmental risks, we also call the attention to lifestyle-related actions, such as smoking. The prevalence of smoking is high in Brazil, with a rate of daily smoking of 15.1%, varying from 17.4% in the Southern region to 12.8% in the North, and is 62% more frequent among men compared to women[7].

Traffic and transit work involves continuous exposure to environmental pollutants, and might cause damage to the respiratory system when associated with smoking. These factors tend to impair the well-being of the involved workers, with negative impact on their QoL. These facts account for the need to investigate and follow up this population of workers to obtain information useful for public health policies targeting them. Therefore, the aim of the present study was to analyze the QoL of motorcycle taxi drivers who smoke or not.

METHOD

The present was a longitudinal epidemiological study with quantitative approach. Subjects were motorcycle taxi drivers from Jataí, in southeastern Goiás, Brazil. All the local unionized motorcycle taxi drivers, to a total of 152[8], were invited to participate in the study.

The inclusion criteria were: having worked as motorcycle taxi driver for 6 months at least, and participation in all the study phases. Only 97 motorcycle taxi drivers met the inclusion criteria and agreed to participate in the study, and two dropped out in the second phase. Therefore, the final sample comprised 95 participants, corresponding to 62.5% of the total eligible population.

We used two instruments for data collection. One was a semi-structured questionnaire with 24 questions to investigate sociodemographic and occupational characteristics and self-perceived state of health. A pilot test was conducted with a similar population of workers from another town to investigate their understanding of questions.

The other instrument was WHOQOL-BREF[9] QoL questionnaire, translated and adapted for use in Brazil[10]. It comprises 26 questions: two which investigate general QoL and the others each of the 24 facets considered in the original instrument, WHOQOL–100, and are distributed across domains physical health, psychological, social relationships and environment. Questions are responded on a Likert scale ranging from 1 to 5[11]; three questions are reverse scored. The final score ranges from 4 to 20 and might be converted into a 0–100 scale; the higher the score the better the perceived QoL[12].

All the interviews were performed at the workplace at the end of the working day, when the participants were given all the necessary information, including the voluntary nature of participation, and signed an informed consent form. The study was divided in two phases to analyze the participants' QoL over time.

On phase 1, which took place in June 2014, the participants received a sealed envelope, which contained the sociodemographic and occupational questionnaire and WHOQOL-BREF. On phase 2, conducted 12 months later in May 2015, the same participants received a sealed envelope containing WHOQOL-BREF only.

The data were entered twice in an Excel® spreadsheet to control for mistyping, and then analyzed with *Statistical Package for the Social Sciences* (SPSS®) version 22.0 and STATA version 12.0. We first performed descriptive analysis of the considered sociodemographic, occupational and self-perceived health variables. Quantitative variables were expressed as mean and standard deviation (SD) and the qualitative variables as absolute and relative frequencies.

The Kolmogorov-Smirnov test with Lilliefors correction was used to test the normality of quantitative variables. To establish the instrument's reliability, the internal consistency of QoL domains was analyzed by means of Cronbach's alpha.

The paired sample t-test or the Wilcoxon test were used to analyze differences in average QoL scores between the two considered time-points and between smokers and nonsmokers. Spearman's correlation, the Mann-Whitney test, Student's t-test and analysis of variance (ANOVA) were used to compare groups and investigate associations between QoL domains and variables skin color, educational level, marital status, accidents, smoking, age, self-perceived state of health, and monthly income.

The significance level was set to $p<0.05$ in all the tests[13]. We performed multivariate analysis by means of a logistic regression model including the variables used to characterize the study population versus QoL domains.

The present study complied with the ethical principles for research involving human beings described in the National Health Council Resolution no. 466/2012, and was approved by a research ethics committee, ruling no. 609,327.

RESULTS

About 98.9% of the participants (94) were male; 68.4% (65) had attended elementary school; 66.3% (63) were nonwhite; 50.5% (48) had a partner; 89.5% (85) were nonsmokers; 67.4% (64) had already suffered work accidents; and 48.5% (46) reported a good self-perceived state of health. Their average age was 39.09 years old (SD±8,71) and their average monthly income BRL 2,439.35 (SD±1,428.34) as shown in Table 1.

Table 2 describes the results corresponding to QoL domains for the total sample and the groups of smokers and nonsmokers at baseline and 12 months later.

The average score decreased on domain physical health (from 86.07 to 74,28; $p=0.091$) and increased on domain environment (from 58.43 to 64.06; $p=0.285$) among smokers. Among nonsmokers, also the average score decreased on the physical health domain (from 79.87 to 76.38; $p=0.014$) and increased on domain environment (from 58.27 to 67.32; $p<0.001$). Difference was not found on the other two domains for either smokers or nonsmokers ($p>0.05$).

Table 3 describes the results of bivariate analysis of factors possibly associated with QoL at baseline.

Age and smoking exhibited association with QoL domain physical health ($p=0.014$; 0.027). Although statistically nonsignificant, the p-value for the association between educational level and QoL psychological domain ($p=0.088$), and between history of work accidents and QoL domain environment ($p=0.071$) was close to the significance threshold. Self-perceived state of health was significantly associated with QoL physical health ($p=0.001$) and psychological domains ($p<0.001$).

On multivariate analysis, following adjustment for skin color, educational level, history of work accidents, smoking, age and self-perceived state health, association was not found with any QoL domain: physical health (ß: 1.53; 95% confidence interval–CI -0.68 – 3.76; $p=0.174$); psychological (ß: 2.63; 95%CI -0.56 – 5.83; $p=0.105$); social relationships (ß: 1.18; 95%CI -5.79 – 8.16; $p=0.737$); environment (ß: 2.92; 95%CI -0.76 – 6.61; $p=0.119$).

On assessment of the internal consistency of QoL domains, the value of Cronbach's alpha was 0.760. On this ground, the instrument's internal consistency was rated acceptable for the analyzed items, as well as exhibiting mutual correlations, which indicates that the instrument was reliable for the purposes of the present study.

DISCUSSION

QoL of motorcycle taxi drivers has been studied worldwide mainly as a function of the many factors which might

Table 1. Personal and occupational characteristics of motorcycle taxi drivers, Goiás, 2014–2015 (n=95).

Variables	n	%
Age (years)		
≤40	55	57.9
>40	40	42.1
Monthly income (times the equivalent of the MW)		
≤2	34	35.8
>2	61	64.2
Marital status		
Without partner	47	49.5
With partner	48	50.5
Skin color		
White	32	33.7
Nonwhite	63	66.3
Educational level		
Elementary school	65	68.4
Secondary school	30	31.6
Smoking		
Yes	10	10.5
No	85	89.5
Alcohol consumption		
Yes	55	58.3
No	40	41.7
Work accidents		
Yes	64	67.4
No	31	32.6
Self-perceived state of health		
Excellent	20	20.6
Very good	14	15.5
Good	46	48.5
Average	15	15.5

MW: minimum wage.

influence it and their work as such. In the present study of self-perceived QoL at two different time-points, we found that the scores decreased on domain physical health and increased on domain environment in a statistically significant manner. Domain physical health includes facets pain and discomfort, energy and fatigue, mobility, sleep and rest, activities of daily living, dependence on medicinal substances and medical aids, and work capacity[11].

Traffic-related hazards, such as traffic congestion, increasing competition within the labor market, social stigma, and customers' pressure to arrive sooner at destination might cause pain, stress at work, fatigue, sleep deprivation or excessive sleepiness. These factors are associated with impaired work ability, and eventually also with traffic accidents, which accounts for the reduction of the scores on domain physical health[14-16].

One study with motorcycle taxi drivers in Jequié, Bahia, Brazil, in which WHOQOL-BREF was applied, found that the domains with the best average scores were social relationships (93.5±13.7) and physical health (84.4±32.1), while general health (70.1±16.5) was the one with the poorest average score[16]. In another study with a similar population and adminstration of WHOQOL-BREF also conducted in Jequié, domains physical health (42.5±10.4), psychological (43.1±9.3), social relationships (61.6±13.9) and environment (28.5±7.7) received low scores[17].

In the present study, the scores on domain environment improved, which might be due to the fact that the autumn—when data collection was performed—is a more pleasant season and exhibited lower carbon monoxide (CO) levels compared to the previous spring and summer.

Assessment of domain environment includes analysis of self-perceived physical safety and security, financial resources, home environment, health and social care, opportunities for acquiring new information and skills, participation in and opportunities for recreation / leisure activities, physical environment (pollution / noise / traffic / climate) and transport[11].

On the evaluation at the second time-point of data collection, the group of smokers exhibited lower scores on domains physical health, psychological and social relationships, however, these differences were not statistically significant. Smoking as such increases the exposure to CO, and when associated with environmental pollution, the

Table 2. Quality of life of motorcycle taxi drivers who smoke or not at two time-points of assessment, Goiás, 2014–2015 (n=95).

Domains	Smokers		p	Nonsmokers		p
	Phase 1	Phase 2		Phase 1	Phase 2	
Physical health	86.07±10.96	74.28±11.88	0.091[a]	79.87±10.17	76.38±9.27	0.014[a]
Psychological	77.08±14.59	78.08±10.02	0.317[b]	77.25±8.09	78.38±8.37	0.370[b]
Social relationships	70.00±23.63	71.66±14.27	0.829[a]	75.88±13.05	78.52±11.95	0.192[a]
Environment	58.43±16.14	64.06±13.44	0.285[b]	58.27±10.43	67.32±11.80	<0.001[b]

[a]Wilcoxon test; [b]paired sample t-test.

Table 3. Analysis of sociodemographic and occupational characteristics and quality of life domains corresponding to motorcycle taxi drivers at baseline, Goiás, 2014, (n=97).

Dom Variables	Physical health		Psychological		Social relationships		Environment	
	Mean±SD	p	Mean±SD	p	Mean±SD	p	Mean±SD	p
Skin color								
White	80.24±11.14	0.902[a]	77.08±7.48	0.772[a]	74.74±12.60	0.619[a]	57.32±11.51	0.449[a]
Nonwhite	80.66±10.05		78.31±9.57		75.52±15.40		58.78±10.88	
Educational level								
Elementary school	79.83±10.32	0.348[a]	76.15±9.00	0.088[a]	74.74±15.79	0.866[a]	58.55±10.29	0.708[a]
Secondary school	82.02±10.50		79.58±8.28		76.38±11.17		57.70±12.73	
Marital status								
Without partner	81.30±10.18	0.357[a]	76.24±9.55	0.343[a]	74.46±16.33	0.944[a]	59.57±11.96	0.204[a]
With partner	79.76±10.60		78.21±8.16		76.04±12.47		57.03±10.05	
Accidents								
No	80.85±10.44	0.911[a]	77.86±7.19	0.532[a]	77.21±13.38	0.152[a]	59.61±9.99	0.071[a]
Yes	79.83±10.37		75.65±11.67		71.23±15.93		55.54±12.72	
Smoking								
No	79.87±10.14	0.027[b]	77.25±8.09	0.672[b]	75.88±13.05	0.596[b]	58.27±10.43	0.927[b]
Yes	87.50±10.81		77.08±14.59		70.00±23.63		58.43±16.14	
Age (years)								
≤40	82.86±9.92	0.014	78.41±8.93	0.131	76.06±16.20	0.533	59.78±11.14	0.108
>40	77.59±10.45		75.63±8.57		74.17±11.91		56.10±10.59	
Self-perceived state of health								
Excellent	85.82±9.49		81.99±7.23		77.45±15.15		61.40±10.93	
Good	77.56±8.70	0.001[c]	73.73±8.42	<0.001[c]	73.91±14.12	0.549[c]	56.13±10.94	0.100[c]
Average	78.33±13.12		77.22±8.89		74.44±14.59		57.50±10.35	
Monthly income	-0.001	0.995[d]	0.093	0.368[d]	0.024	0.815[d]	-0.015	0.887[d]

[a]Mann-Whitney test; [b]Student's t-test; [c]analysis of variance (ANOVA); [d]Spearman's correlation.

carboxyhemoglobin (COHb) increases even more, thus exposing smokers to greater risk[18].

On analysis of the association between sociodemographic factors and QoL, variables age and smoking exhibited statistically significant relationship (p<0.05). In turn, the p-value for variables educational level and history of work accidents was close to the significance threshold, representing a weak association. These variables were considered in most studies conducted with motorcycle taxi drivers, which found that these workers are older, have low educational level and high rates of work accidents.

A study performed in Mexico described the health and working conditions of motorcycle taxi drivers by means of instruments to collect data on the workers, their family and work environment. The results evidenced poor working conditions, long working hours (11.3 hours per day), low salary (USD 59.18 per week) and lack of social protections or benefits. About 6.3% of the participants reported occurrence of some disease, 49.5% of which corresponded to musculoskeletal disorders. Only 11.6% of the sample had access to some form of health care. The authors inferred there was a relationship between the workers' lifestyle (based on the salary received), working conditions (physical exhaustion) and state of health. Thus they concluded that the precarious material conditions of motorcycle taxi drivers makes it difficult to reproduce their labor power and their plans in life, and that these conditions determine their quality of life and work[19].

A study conducted in Rio Grande do Sul, Brazil, to analyze occupational hazards and self-reported vulnerabilities of motorcycle taxi drivers found that they work under precarious environmental working conditions, including exposure to sunlight, rain, physical and emotional exhaustion, and mainly to thefts and traffic accidents. The authors concluded that these conditions account for unsafety at work, and are likely to impair the health, safety and well-being of this population of workers[15].

One study conducted in Jequié, Bahia, Brazil, to assess the QoL of 400 motorcycle taxi drivers found that the main hazards to which they were exposed were heat (94.8%), excessive noise (93.5%), dust (93.8%) and gases, steam and fumes (90.8%)[17]. These facts show that all across the country this population of workers is exposed to environmental factors inherent to their job.

The limitations of the present study include: small number of smokers and lack of control of the number of cigarettes smoked per day. On these grounds, we suggest for future studies to include control groups to achieve more thorough knowledge on smoking among motorcycle taxi drivers to test the hypothesis resulting from the present study.

CONCLUSION

Based on the aforementioned considerations, we might conclude that motorcycle taxi drivers are exposed to several factors likely to influence their living and working conditions, especially among smokers.

The results of the present study are relevant, and should serve as a warning to health surveillance services, inasmuch as the analyzed motorcycle taxi drivers exhibited diversified symptoms of environmental exposure. In addition, they should call the attention of legislators to regulate this occupation, which will warrant jobs, salaries, retirement and another labor benefits.

Our findings might further contribute to the promotion of health strategies among healthcare professionals seeking to improve the quality of life and work of this population of workers.

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