104 - ERGONOMIC ANALYSIS IN LABOR OF TAXI DRIVERS

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1.INTRODUCTION

With population growth and the increasing need to shift within the existing urban centers, one of the professions which becomes increasingly imperative is the taxi driver or taxi driver.

Taxi drivers play an important role for society as aim to move people with quality, comfort and safety. Like any driver who remains a big chunk of your day in front of the steering wheel, taxi drivers present a worrying picture in relation to their health, because a large portion of these professionals is sedentary, which is not beneficial to health (Costa et al., 2003) and still remains large static length of their workday in jobs often or somewhat ergonomic (comfortable). Thus, this work aims to address the health / ergonomics with a focus on the profession of taxi driver.

It is noteworthy that the ergonomics seeks to adapt the psychophysiological conditions of labor to man in such a way as to make the man feel good in your job, as the Regulatory Standard NR - 17 of the Ministry of Labor and Employment (BRAZIL , 2014).

The practical application of ergonomics, can be done through an Ergonomic Work Analysis, which according to Iida (2005), aims to apply ergonomic knowledge to correct an actual situation, through analysis, to further formulate a diagnosis. It is divided into five phases: analysis of demand, task analysis, activity analysis, formulation of diagnosis, and ergonomic recommendations.

According to Grandjean (1998) the term ergonomics comes from the Greek and is nothing more than "ergon = work" and "nomos = law standards". And according to Dul and Weerdmeester (2004), is an applied eg in the design of machinery, equipment, systems and science tasks, with the aim of improving the safety, health, comfort and work efficiency.

One of the functions of ergonomics is to provide the employee a more pleasant and comfortable environment, where he can have a certain quality of life, which is important for all workers and taxi drivers. Limongi-França (2004), the term quality of life at work can be defined as a process that consolidates the pursuit of human and organizational development.

For França (1996) the quality of work life is a set of actions of a company that involves improvements and innovations within and outside the work environment, with the goal of providing conditions of human development during the work.

The doctor Dirceu Alvez Rodriquez, director of the Brazilian Association of Traffic Medicine, said that the incorrect position of the driver can generate high muscle fatigue which can lead to serious spinal injuries, and it is for this reason that the ideal is that the driver always find a comfort zone inside the vehicle, adjusting the seat to the pedals, which are fixed, in order to achieve them effortlessly, as well as the steering wheel. The indicated according to Dr. Alvez is not touching the calf and not the back of the knee on the bench. However, there is only one ideal position, sometimes different settings may allow a more comfortable position, and yet, this change of attitude is extremely beneficial for the body, because then the worker can overwhelm muscularly different parts of the body along its workday (CARVALHO, 2011).

According to Carvalho (2011), as the seat height, this should not be too high, in order to avoid the pressure behind the knees. The ideal is to have at least 3 fingers away so that nerves and veins can not be pressured and end up compromising the bloodstream. Figure 1 illustrates the ideal position.



Figure 1 - Ideal for work as a driver's seat height position. Source: CARVALHO (2011).

According to Carvalho (20011) column should be 100% in contact with the backrest, and the best angle is between 100 and 120 to tilt the seat (Figure 2). It is interesting to note that the very straight-backed leaves tense muscles, causing discomfort, and stop with excessive slope increases the risk of sliding under the belt in a collision. As for the position of the arms, Carvalho cites the need to stay slightly bent elbow, approximately 120, with hands getting together on top of the steering wheel without taking off the shoulders of the bank (Figure 3).



Figure 2 - Tilt the seat back should be 100 to 120º. Source: CARVALHO (2011).



Figure 3 - Ideal position of the arms while driving. Source: CARVALHO (2011).

Thus this article aims to conduct ergonomic job analysis on drivers of taxis, in order to generate recommendations that may cause them to have more quality of life in their work and minor negative consequences of their grueling routine work.

2. METHODOLOGY

Currently the city of Curitiba, considered the green capital of Brazil, according to the Urbs - Urbanization of Curitiba S / A (the company that handles public transportation in the city) has 2,894 taxi drivers in a total of 184 points distributed around the city by taxi, being that the average age of existing taxi fleet is 1.55 years, data for June 2014 (URBS, 2014).

This research considered a case study was conducted through interviews and conversations with 30 taxi drivers in the city of Curitiba between August and October 2014, and all the taxi drivers were working, or had their points in the central region the city of Curitiba, which currently has more than 1.8 million people.

Initially questions of a more general nature were made to profile the professional as:

- How long (year (s)) is working in this profession ?;
- What is the shift ?;
- How long have you rest throughout their working day ?;
- Do you feel any kind of discomfort during your workday?.

Later Diagram Painful Regions (CORLETT, MANENICA, apud ITIRO, 2005) was used, asking employees if they pointed the diagram the regions where they felt discomfort or pain during work activities. The questionnaires were completed anonymously and were used in the ergonomic analysis of the job.

3. RESULTS AND DISCUSSION

Initially the results tabulated with the responses of general questionnaire responses ergonomic questionnaire was obtained from the taxi drivers and will be presented later.

3.1 Results and discussions about the general questionnaire

Initially we sought to characterize the manpower working in this type of service. Thus, in Figure 4 is the average working time for the profession of taxi driver from each of the 30 workers interviewed.

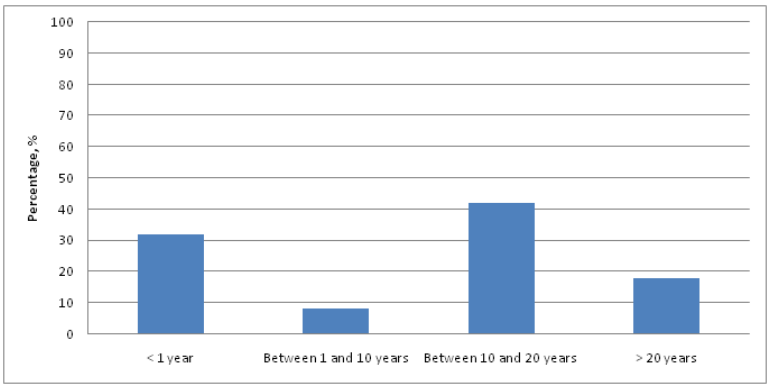

Figure 4 - Time in the profession

Analyzing the Figure 4 we have that the vast majority of respondents, 42% have between 10 and 20 years in the profession of taxi driver, which somehow shows that although the profession has its problems and some dangerous because normally the driver ignores your prospect is not a very bad job, because we note that they tend to stay in this profession often until his retirement. Figure 5 shows the results of responses when they were asked about the shifts performed by them.

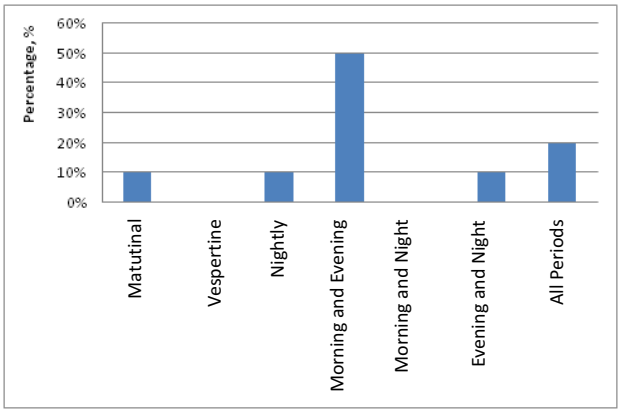

Figure 5 - Shift Work

Analyzing the results in Figure 5 we note that the vast majority of employees work or prefer to work in normal (common) work period, ie, from 08:00 hours to 18:00 hours. According to respondents, this happens because it is obviously that time of day to trade and open up more companies that have demand for this professional.

Figure 6 presents the results of interviews as the existence of relaxation times (intervals) during working hours, including lunch, and was made the following question: "How long do you have to rest throughout your workday ? ".

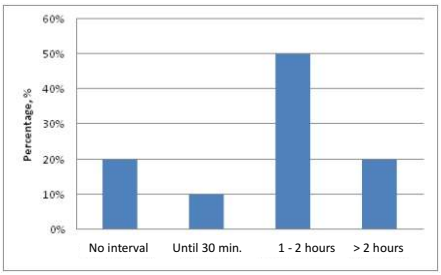

Figure 6 - Rest time during the workday.

Analyzing the Figure 6 we note that most pauses, especially for lunch at least 1 hour per day, which is correct. However, none of the workers reported using a time during your service to do relaxation exercises or gym work. And also reported that the companies they work for do not have any concern in this regard.

Figure 7 presents the answer to the question: "Do you feel any kind of discomfort during your workday?".

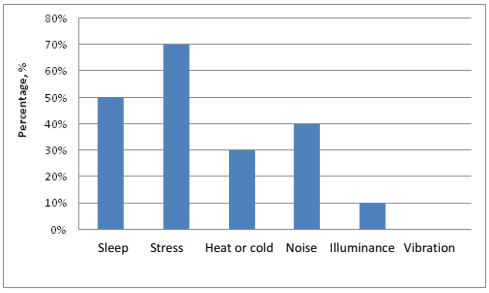

Figure 7 - Discomfort appointed by drivers.

According to the responses obtained ma Figure 7, the main discomfort appointed by taxi drivers is due to stress, which can be explained by heavy traffic they face every day, also by noise and vibration to which they are exposed in their jobs, although disregarding many times, as in the case of occupational they are subject to vibration.

3.2 Results and discussions about the general questionnaire

The results of implementing the painful areas diagram that showed how much pain, 80% of respondents complained of pain during or after the workday, which were more common in the leg and spine position by staying for long hours of constant service . This is because of the work consists primarily of the use of the feet on the pedals of the car and why they often do not have a setting suitable for height, distance and tilt of the seat offers greater comfort to the driver. For lack of inspection and training courses firms, taxi drivers often have no knowledge that they can be the cause of these disturbances.

It was noted during interviews that the majority of respondents were overweight, which elucidates the research conducted by Sena et al. (2008), which showed that 80% of respondents (taxi drivers) were overweight, and that this was related to long working hours, lack of exercise and poor diet, which is based on fast food.

One of the factors that contribute to complaints from workers about the existence of pain during the workday is often the lack of breaks for performing stretches, which was also observed by Lamoglia et al. (2011) in his survey of taxi drivers.

Also observed with the survey that the majority of taxi drivers were smokers, which according to the respondents was one way to reduce stress, similar to that observed in studies of Fernandes (2008).

4. CONCLUSIONS

It is concluded that 80% of respondents (24 cabbies) said they felt pain throughout your workday which can often be explained by incorrect postures work and lack of transferring these over your workday. It is recommended therefore mainly companies that hire these professionals to provide training for the same or even booklets with information appropriate to adopt postures of the vehicle and dental forms of exercise in between the "races" that are throughout the day, because this way surely the issue of ergonomic work environment of these professionals could be improved.

Interesting for these professionals regarding their health recommendation is to conduct a workplace exercise especially before his workday so they can stretch all the muscles that will be used throughout your day. It is noteworthy that these tips can make the job of taxi drivers more "human" and more healthy, and perhaps it may suffer not only less stressful, but also less pain, they may have a more ergonomic work station.

REFERENCES

BRAZIL, Ministry of Labour and Employment. NR17 - Ergonomics. Manual Atlas Legislation. 74th. Edition, 2014.

CARVALHO, R. Position of Driving: You Think in Comfort? So It's Time to Make Some Adjustments. Quatro Rodas magazine, Jan, 2011. Available at: <http://quatrorodas.abril.com.br/reportagens/posicao-dirigir-615274.shtml>. Access on 23 August 2014.

DUL, J., WEERDMEESTER, B. Ergonomics Practice. 2.ed. São Paulo. Edgard Blücher, 2004.

FERNANDES, M.M.P. Anxiety, Depression, Stress and Tobacco. 2008. Available at: <http://bdigital.ufp.pt/handle/10284/1466>. Access on: 01/10/2014.

FRANÇA, A.C.L. Business Indicators of Quality of Life: entrepreneurial effort and employee satisfaction in a manufacturing environment with ISO 9000. Doctoral Thesis, São Paulo certification: FEA / USP, 1996.

GRANDJEAN, E. Ergonomics Handbook: adapting the work to the worker. 4th ed. Porto Alegre: Bookman, 1998.

IIDA, I. Ergonomics: Design and Production. 2nd Edition Revised and Expanded, São Paulo: Editora Edgard Blucher, 2005.

LAMOGLIA, D. A. S.; MELLO, J. R. C.; PALAZZO, W.; RUAURO, J. A.; FREZ, A.R. Occurrence of Musculoskeletal

Disorders in taxi drivers in the city of Foz do Iguaçu, Paraná. Apr 2011. Available at: <http://www.inspirar.com.br/revista/wp-content/uploads/2011/05/ed11_revista_cientifica_inspirar_mar_abr_2011.pdf#page=18>. Access on: 01/10/2014.

LIMONGI-FRANÇA, A.C. Quality of work life: concepts and practices in the Business Post-Industrial Society. São Paulo: Atlas, 2004.

SENA, J. E. A.; BRIDGES, L. M.; FERREIRA, U. M. G .; SILVA, M. J. of. Body and Its Relation With the Physical Activity Level of Taxi Drivers and Postmen composition of João Pessoa - PB. Feb. 2008. Available at: <http://www.fpjournal.org.br/painel/arquivos/353-04%20Taxistas%20e%20Carteiros%20Rev%201%20-%202008.pdf>. Access on: 22/10/2014.

URBS. Transportation. Available at: <http://www.urbs.curitiba.pr.gov.br/transporte/taxis>. Access on: 22/10/2014.

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ERGONOMIC ANALYSIS IN LABOR OF TAXI DRIVERS

ABSTRACT

Taxi drivers in Brazil workloads have very extensive work and during most of the time, remain in static positions. Based on this statement it can be said that these professionals are very prone to health problems and muscle pain. Considering these issues, this paper aims to conduct an ergonomic analysis on taxi drivers, accompanying their day to day in the city of Curitiba. Thus, was developed and implemented a simple questionnaire and objective, focused on ergonomics and health as a whole as well as the diagram Regions sore was used to lift the body parts that they felt pain for 30 taxi drivers working around central city. The interviews were made with these professionals in their working environments during their "services". The results showed worrisome data, for example that most of these workers have daily back pain and leg, high levels of stress, obesity, among other problems. We conclude therefore that before it becomes necessary to implement the guidelines, conducted by health professionals in order to correct the postures and the improvement of the general health of these workers while performing their activities programs.

KEYWORDS: Ergonomic Work Analysis, Taxi Driver, Posture.

ANALYSE ERGONOMIQUE DU TRAVAIL DES CHAUFFEURS DE TAXI

RÉSUMÉ

Les chauffeurs de taxi à la charge de travail Brésil ont un travail très vaste et pendant la plupart du temps, restent dans des positions statiques. Sur la base de cette déclaration, on peut dire que ces professionnels sont très sujettes à des problèmes de santé et des douleurs musculaires. Compte tenu de ces questions, ce document vise à procéder à une analyse ergonomique sur les chauffeurs de taxi, accompagnant leur vie quotidienne dans la ville de Curitiba. Ainsi, nous avons développé et mis en place un questionnaire simple et objectif, axé sur l'ergonomie et de la santé dans son ensemble ainsi que les régions du diagramme maux a été utilisé pour soulever les parties du corps qui, selon eux, la douleur pendant 30 chauffeurs de taxi qui travaillent autour centre-ville. Les entrevues ont été réalisées avec ces professionnels dans leur milieu de travail pour leurs "services". Les résultats ont montré des données inquiétantes, par exemple que la plupart de ces travailleurs ont quotidiennement la douleur et de la jambe, des niveaux élevés de stress, l'obésité, entre autres des problèmes de dos. Nous concluons donc que, avant, il devient nécessaire de mettre en œuvre les lignes directrices, menées par des professionnels de la santé afin de corriger les postures et l'amélioration de la santé générale de ces travailleurs lors de l'exécution de leurs programmes d'activités.

MOTS-CLÉS: Analyse ergonomique du travail, Chauffeur de taxi, Posture.

ANÁLISIS ERGONÓMICO EN TRABAJO DE LOS TAXISTAS

RESUMEN

Los taxistas en Brasil tienen cargas de trabajo muy extenso trabajo y durante la mayor parte del tiempo, se mantienen en posiciones estáticas. Sobre la base de esta declaración se puede decir que estos profesionales son muy propensos a problemas de salud y dolor muscular. Teniendo en cuenta estas cuestiones, el presente trabajo tiene como objetivo realizar un análisis ergonómico de los taxistas, que acompaña a su día a día en la ciudad de Curitiba. Por lo tanto, hemos desarrollado e implementado un cuestionario sencillo y objetivo, centrado en la ergonomía y la salud en su conjunto, así como las Regiones diagrama doloridos fue utilizado para levantar las partes del cuerpo que se sentían dolor por 30 taxistas que trabajan alrededor ciudad central. Las entrevistas se realizaron con estos profesionales en sus entornos de trabajo durante su "carrera". Los resultados mostraron datos preocupantes, por ejemplo, que la mayoría de estos trabajadores tienen a diario el dolor de espalda y la pierna, altos niveles de estrés, la obesidad, entre otros problemas. Concluimos, por tanto, que antes de que sea necesario para poner en práctica las directrices, llevada a cabo por profesionales de la salud con el fin de corregir las posturas y la mejora de la salud general de estos trabajadores en el desempeño de sus programas de actividades.

PALABRAS CLAVE: Análisis Del Trabajo Ergonómico, Del Taxista, La Postura.

ANÁLISE ERGONÔMICA NO TRABALHO DE TAXISTAS

RESUMO

Os taxistas no Brasil apresentam cargas horárias de trabalhos muito extensas e durante maior parte do tempo, permanecem em posições estáticas. Com base nessa afirmação pode-se dizer que estes profissionais estão muito propensos a problemas de saúde e dores musculares. Partindo destes problemas, este artigo tem como objetivo realizar uma análise ergonômica em motoristas de táxi, acompanhando seu dia a dia, na cidade de Curitiba. Para tanto foi elaborado e aplicado um questionário simples e objetivo, focado em ergonomia e na saúde como um todo bem como foi utilizado o Diagrama de Regiões Doloridas, para levantar as partes do corpo que os mesmos sentiam dores, para 30 taxistas que trabalhavam na região central da cidade. As entrevistas com estes profissionais foram feitas em seus respectivos ambientes de trabalho, durante suas "corridas". Os resultados apontaram dados preocupantes, como por exemplo que a maioria destes trabalhadores apresentam diariamente dores na coluna e nas pernas, altos índices de estresse, obesidade, entre outros problemas. Conclui-se desta forma que diante disso torna-se necessário a implantação de programas de orientações, realizadas por profissionais da saúde, visando à correção de posturas inadequadas e na melhoria das condições de saúde em geral destes trabalhadores durante a execução de suas atividades.

PALAVRAS-CHAVE: Análise Ergonômica do Trabalho, Taxista, Postura.