46 - TEMPORAL VARIATION OF MORPHOLOGICAL PARAMETERS OF INDIVIDUALS EXPOSED TO THE SAME PROFESSIONAL PERFORMANCE STANDARD

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INTRODUCTION

Large concentrations in cities give rise peculiar problems, including urban transportation. The public transportation has been a simple and known solution for many years and even today the bus is one of the most used means of transportation in Brazilian cities and around the world, contributing to the people displacement. Some working conditions relatively appeared due to the effective usage of this means of transport and we could see through some Brazilians and foreigners studies that the bus drivers fall ill in a different way than population in general.

Norman (1958) conducted one of the most classic studies about bus drivers in London City, the largest urban passenger traffic that undertakes in the world. Several researches have shown that in our environment a bus driver is exposed to stressful activities that involve not only his health, but also the passengers and the pedestrian safety. According to Costa et al (2003) within the concept of validity system that is an agreed concept in specialized literature for referring to morbidity conditions diagnose, it is perfectly reasonable to proceed in the search for explanations for the health problems of these drivers under the conditions in which they live and work.

Being healthy is a dynamic situation. Being healthy or not is an inaccurate condition due to various factors such as general working conditions, physical inactivity, and workplace, among others that set different situations to the bus drivers' life (Robazzi et al., 2002). For Wang and Lin (2001), the health dangers of bus drivers are well known. According Junior (2003) who phrases from various authors as: "bus driver profession is high risk to the health and well-being", "driving buses in urban centers is a profession considered extremely stressful", "bus driver profession is one of the most stressful and unhealthy occupations, ". These statements were said more than a decade; still, they are unfortunately true today.

For the few reports about bus drivers and occupational health, and for the increasing importance of this category in large Brazilian cities, we decided to develop this study in order to determine how the morphological values in bus drivers aged 25 to 57 years have varied at a two-year interval.

METHODOLOGY

An observational study was scored for two consecutive years and consisted of observations at three different times. The sample comprised of 179 males, aged 25 to 57 years, all of them bus drivers belonging to a bus company to interstate transportation in Bahia, Brazil. Selection criteria: being driver of that company, have done a physical assessments academy in Feira de Santana - Bahia, absence of health problems at the time of physical assessments, have been evaluated in a two-year interval, with three observations in this period, the interval between the observations could not exceed 15 months and at least 9 months, drivers should present results on all variables selected for the study. The variables analyzed, the object of this study were: Weight, Height, Fat Percentage, Fat weight, Lean weight, Circumferences, Body Mass Index, and Waist-Hip Ratio.

PROCEDURES

We collected data from a gym physical assessment record from Feira de Santana, for recording it was used a physical test program for Windows. All measurements were performed by two graduate teachers in Physical Education who were unaware of the study hypothesis. The test battery consisted of: height-weight measures and measures of body composition. The subjects were split into five groups: Group 1 - Drivers belonging to the age group of 25 to 30 years (G1). Group 2 - Drivers aged 31-35 years (G2). Group 3 - Drivers aged 36-40 years (G3). Group 4 - Drivers aged 41-45 years (G4). Group 5 - Drivers aged 46-59 years (G5). Height-Weight Measures: Body weight was checked with individuals barefoot, wearing light clothing, using a digital scale accurate to 0.1 kg. The waist and hip circumferences were measured with a tape measure and height was measured with an estadiometer. For anthropometric data, we used the Pollock and Willmore protocol (quoted in Physical Test, 1996) and the anatomical points observed were: Waist: measured in the standing position, feet together and abdomen relaxed. The measurement was performed in the horizontal plane in the region of smaller circumference above the umbilicus, shortly after the end of a normal expiration. Hips: the individual remained standing, and feet together. This measurement was performed in the horizontal plane and the largest circumference around the buttocks. Measures of Body Composition: Jackson Pollock equation was used to assess body composition (quoted in Physical Test, 1996), this equation was used to calculate the following skinfolds: chest, abdomen and thigh were dividing in compartments, based on the very structural composition. These compartments are: adipose tissue or fat mass and lean body mass. We calculated the body mass index (BMI) by dividing the value of weight in kilograms (kg) by the square of height, measured in meters (kg/m2). The waist measurement was performed at the time of the umbilicus and hip measurement at the level of the greater trochanters. The values found in the waist-hip ratio are important in analyzing the association with risk factors for cardiovascular diseases. Statistical analysis: The collected data were entered in said computer program SPSS 11.0, to apply statistical methods.

RESULTS AND DISCUSSION

Descriptive statistics of height-weight values

Among the anthropometric measurements we highlight the approximated values for the height measurement; it was observed a small standard deviation. On weighing the drivers had similar averages about 76 kg, a larger variation of the minimum weight was observed in the 1st observation of 54.7 Kg weight for the minimum weight in the 3rd observation of 58.5 Kg, and a decrease of the maximum weight in the 1st observation from 106.2 kg to 100 kg in the 3rd observation, thus, there was a lower standard deviation over time.

Table 01. Descriptive statistics: minimum values, maximum values, averages and standard deviations of variables: age, height and weight of 179 drivers assessed and age groups.

Variables	N	Minimum	Maximum	Averages and Standard Deviation	25-30 Year-old G1	31-35 Year-old G2	36-40 Year-old G3	41-45 Year-old G4	46-59 Year-old G5
Age	179	26	59	38,82	28,9	33,1	37,6	42,7	48,59
				± 6,52	± 1,1	± 1,4	± 1,3	± 1,3	± 2,6
Height	179	161	187	171,12	173,9	171,5	171,7	169,2	170,4
				± 5,45	± 6,7	± 5,6	± 5,1	± 4,3	± 5,4
Total Weight1	179	54,7	106,2	76,67	75,7	77	76	75,8	78,7
				±10,49	±10,6	±11,8	±10,1	± 9,6	±10,3
Total Weight2	179	54,7	101,5	76,35	74,5	77,2	75,1	75,6	78,8
				± 9,86	±11,1	±11,3	± 9,1	± 8,8	± 9,2
Total Weight3	179	58,5	100	76,51	75,5	77,5	75,4	75,6	78,4
				± 9,59	±11,2	±10,7	± 8,8	± 8,6	± 9,2

Descriptive statistics of BMI and WHR

The principle of BMI (Body Mass Index) is to estimate the proportion and/or the relationship between total body weight and height of an individual. The values found in BMI 1 averages 26.16 1 kg/m², BMI 2 of 26.05 kg/m and BMI 3 of 26.10 kg/m², it was given a rating of moderate risk for males

Table 02. Descriptive statistics, the arithmetic mean and standard deviation of the variables BMI and WHR of the five age groups of bus drivers

Variables	N	Minimum	Maximum	Averages and Standard Deviation	25-30 Year-old G1	31-35 Year-old G2	36-40 Year-old G3	41-45 Year-old G4	46-59 Year-old G5
BMI 1	179	18,62	36,75	26,16	24,9	26	25,7	26,5	27,1
				± 3,25	±2,7	± 3,2	± 3,1	± 3,4	±3,2
BMI 2	179	18,62	33,74	26,05	24,5	26,1	25,4	26,4	27,1
				±3,01	±2,7	± 3,0	± 2,9	±3,0	± 2,8
BMI 3	179	19,16	34,60	26,10	24,8	26,2	25,5	26,4	27,0
				± 2,85	±2,7	± 2,8	± 2,7	± 2,8	± 2,8
WHR 1	179	0,77	1,00	0,8905	0,87	0,88	0,88	0,90	0,91
				±0,0368	± 0,03	± 0,03	± 0,04	± 0,03	± 0,03
WHR 2	179	0,79	1,26	0,8939	0,86	0,89	0,87	0,91	0,92
				±0,0445	±0,03	±0,06	±0,03	±0,04	±0,04
WHR 3	179	0,80	1,01	0,8929	0,87	0,88	0,88	0,91	0,91
				±0,0380	±0,03	±0,03	±0,03	±0,03	±0,03

The major results of BMI were found in G5. We found little variation in BMI between the observations in each group. The results of the G1 had the lowest average BMI between the groups. The standard deviation values of all groups decreased over time, except for the G1 which remained stable, decreasing standard deviation in most groups, it is due to a decrease in maximal and an increase in minimal values, to characterize an approximation of data over time, possibly due to the influence of revaluations or by the concern for drivers with health indicators.

The WHR values are increasing from group to group, demonstrating increased risks to health with age advancing. This increase in the results is slow in the first groups, but from G3 to G4 the increase is more pronounced. The lowest value recorded for waist-hip ratio was 0.77 cm in the area of low risk. And the highest value was 1.26 cm in the area of very high risk. For Costa et al. (2003) the obesity and pre obesity, measured by the body mass index, are a serious health problem for drivers, both in Belo Horizonte and Sao Paulo.

Table 03. Descriptive statistics, the arithmetic mean and standard deviation of the fat percentage variables, fat weight and lean weight of the five age groups of bus drivers

Variables	N	Minimum	Maximum	Averages and Standard Deviation	25-30 Year-old G1	31-35 Year-old G2	36-40 Year-old G3	41-45 Year-old G4	46-59 Year-old G5
Percentage	179	6,20	36,2	21,32	17,8	20	20,8	22,6	24
Fat 1				± 6,29	± 6,9	± 5,7	± 6,2	±5,9	±5,8
Percentage	179	4,14	32,07	20,55	16,6	20	19,8	21,8	22,8
Fat 2				± 5,49	± 5,7	± 5,6	± 5,0	± 5,0	±4,8
Percentage	179	4,34	35,41	20,25	17,2	20,2	19,3	21,2	22
Fat 3				± 5,52	± 6,3	± 5,2	± 5,0	± 5,4	±5,4
Fat Weight 1	179	4,03	37,36	16,78	13,9	15,9	16,3	17,6	19,2
				±6,57	± 6,3	± 6,3	± 6,6	± 6,2	±6,6
Fat Weight 2	179	2,4	30,54	16,03	12,7	15,9	15,2	16,8	18,2
				± 5,60	± 5,5	± 6,1	±5,3	± 5,0	±5,2
Fat Weight 3	179	2,59	34,7	15,83	13,5	16	14,8	16,3	17,6
				± 5,63	± 6,2	± 5,5	±5,1	± 5,3	±5,8
Lean Weight1	179	46,4	78,32	59,89	61,8	61,1	59,7	58,2	59,5
				± 6,26	±7,0	± 7,0	± 5,4	±5,4	±6,3
Lean Weight 2	179	46,13	79,2	60,33	61,8	61,2	59,9	58,8	60.6
				± 6,04	± 7,0	± 6,9	± 5,2	±5,4	±5,9
Lean Weight 3	179	48,35	80,37	60,69	61,9	61,5	60,5	59,3	60,8
				± 5,84	± 6,7	±6,7	±5,2	± 5,1	±5,5

The results of the 1st observation for the 3rd observation showed a decrease in the percentage of fat, which characterizes the concern of the driver with this variable, thus, we find a major difference from the 1st to the 2nd observation and an accommodation on the values from the 2nd to the 3rd observation. The best results in decreased fat percentage occurred in older drivers. The average percentage of fat and fat weight decreased during the evaluations. However, the average lean weight increased. The decrease of the mean fat weight was nearly three times higher in the percentage concerning to the lean body mass average. An interesting finding is that in all these fat percentage variables, fat weight and lean weight, the standard deviation reduced, in which characterize the greater homogeneity in the results in relation to time. Concerning to the time interval the variables total weight, WHR and BMI studied during two years showed similar results for the three observations for each group.

CONCLUSION

In spite of not being the central goal of our work we found in our analysis of the data that the bus drivers have unfavorable results for health indicators, showing as cited in several studies in other countries, that this occupation affects this kind of professional and increases the susceptibility of an individual to develop or promote any chronic degenerative disease. Another interesting aspect is that several studies attribute values and demonstrate the effects of the habits of a person in his/her quality of life, however, this work emphasizes that only through physical assessments undertaken, the individuals present in general, an improvement in their health indicators in the course of time. Changes in conditions and working environment of the bus drivers are required in order to minimize the impact of work on the health of these workers.

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TEMPORAL VARIATION OF MORPHOLOGICAL PARAMETERS OF INDIVIDUALS EXPOSED TO THE SAME PROFESSIONAL PERFORMANCE STANDARD

ABSTRACT

This study aimed to check how the morphological values in bus drivers aged 25 to 57 years have varied at a two-year interval. Several national and international studies have shown that the bus drivers fall in ill and die in a different way than population in general. The study was observational, scored during two consecutive years and consisted of observations, at three different times, by assessing height-weight values, body composition, waist-hip ratio and BMI. The study sample consisted of 179 male subjects, aged 25 to 57 years, all of them bus drivers belonging to a company of interstate transportation from Bahia, Brazil. The subjects were split into five according to age group. The collected data were entered into a computer program SPSS 11.0 in order to apply the statistical methods. In analyzing the data we found that the bus drivers showed unfavorable results for health indicators, showing as cited in several studies in other countries, that this occupation affects and increases the susceptibility of an individual to develop or promote any chronic degenerative disease. Through physical assessments conducted, the individuals presented in general, an improvement in their health indicators over a time, and even with these data, we highlight the need to implement programs to promote health and better working conditions for these workers.

KEYWORDS: Bus drivers, occupational health and physical assessment.

VARIATION DU TEMPS DES PARAMÈTRES MORPHOFONCTIONNELLES DES INDIVIDUS EXPOSÉS PAR LE MÊME MÉTIER

RÉSUMÈ

Cette recherche a étudié la variation du temps depuis deux années, des valeurs morphologiques en chauffeur d'autobus à l'âge de 25 et 27 ans. Plusieurs études nationaux et internationaux montrent que les chauffeurs d'autobus sont victimes de maladie que n'existe pas dans la plus partie de la population en général. Cet étude a été d'observation en signalant depuis des années precedants à trois mois différents avec valeurs « estaturoponderais », de la composition corporel ceinture-hanche e de IMC. Le corpus de cet étude a été constitué par 179 individus du genre masculin, avec l'âge entre 25 et 27 ans, tous ceux chauffeurs d'autobus qui font partie d'une intreprise de transport publique dans l'État de Bahia-Brésil. Les employeurs ont été divisés en cinq groupes d'âge. Les corpus ont été introduits dans le programme informatisé SPSS 11.0, pour l'applications des statistiques. Pendant l'analyse du corpus ont constaté que les chauffeurs d'autobus ont présentés désavantages pour l'indicateur de la santé. Ça a montré que les resultats des recherches des autres pays sur ces maladies expliquent que ce métier augmente la possibilité de ces employeurs dévélopper quelque maladie cronique-générative. Les bilans ont exposés que ceux individus ont présentés l'amélioration dans les indicateurs de santé pendant le temps d'analyse. Ainsi, on peut dire à partir de ça qu'il faut implanter un programme pour la santé et pour améliorer la condition de travail de ceux employeurs.

MOTS-CLÉ : chauffeur d'autobus ; santé du métier ; évaluation physique.

VARIACIÓN TEMPORAL DE LOS PARÁMETROS MORFOLÓGICOS DE INDIVIDUOS EXPUESTOS A LOS MISMOS ESTÁNDARES DE DESEMPEÑO PROFESIONAL

RESUMEN

Este estudio tuvo como objetivo determinar cómo ha variado el lapso de tiempo de dos años, los valores morfológicos en los conductores de autobuses de 25 a 57 años. Diversos estudios nacionales e internacionales han demostrado que los conductores de autobuses tienen una enfermedad y muerte diferente de la población general. El estudio fue de observación, durante dos años consecutivos, en tres momentos diferentes, los valores de peso, estatura, composición corporal, relación cintura-cadera y el IMC fueron evaluados. La muestra del estudio consistió de 179 sujetos de sexo masculino, de 25 a 57 años, todos los conductores de autobuses pertenecientes a una empresa de transporte interestatal de Bahía, Brasil. Los sujetos se dividieron en cinco grupos de edad. Los datos recogidos se introdujeron en el programa informático SPSS 11.0, para aplicar los métodos estadísticos. Al analizar los datos se encontró que los conductores de autobuses mostraron resultados desfavorables para los indicadores de salud, como se cita en varios estudios realizados en otros países, que esta ocupación afecta y aumenta la susceptibilidad de un individuo a desarrollar o promover cualquier enfermedad degenerativa crónica. A través de evaluaciones físicas realizadas, los individuos presentan, en general, una mejora en sus indicadores de salud con el paso del tiempo, e incluso con estos datos ponen de relieve la necesidad de implementar programas de promoción de la salud y mejores condiciones de trabajo para estos individuos.

PALABRAS CHAVES: Conductores de autobús, la salud ocupacional y la evaluación física.

VARIAÇÃO TEMPORAL DOS PARÂMETROS MORFOLÓGICOS DE INDIVÍDUOS EXPOSTOS A UM MESMO PADRÃO DE DESEMPENHO PROFISSIONAL

RESUMO

Este estudo teve como objetivo verificar como variaram num intervalo temporal de dois anos, os valores morfológicos em motoristas de ônibus com idade entre 25 a 57 anos. Vários estudos nacionais e internacionais têm evidenciado que os motoristas de ônibus apresentam um adoecer e morrer diferente da população em geral. O trabalho foi observacional, pontuados durante dois anos seguidos e constituiu-se de observações, em três momentos distintos, de valores estaturo-ponderais, da composição corporal, da razão cintura-quadril e do IMC. A amostra do estudo foi constituída por 179 indivíduos do sexo masculino, com idade entre 25 a 57 anos, todos motoristas de ônibus pertencentes a uma empresa de transporte interestadual do estado da Bahia-Brasil. Os sujeitos foram divididos em cinco grupos etários. Os dados recolhidos foram introduzidos no referido programa informatizado SPSS 11.0, para aplicar os tratamentos estatísticos. Na análise dos dados constatamos que os motoristas de ônibus apresentaram resultados desfavoráveis para os indicadores de saúde, mostrando como citado em diversos estudos em outros países, que esta ocupação profissional afeta e aumenta a susceptibilidade de um indivíduo desenvolver ou favorecer alguma doença crônico-degenerativa. Através das avaliações físicas realizadas, os indivíduos apresentaram de uma forma geral, uma melhora nos seus indicadores de saúde com o decorrer do tempo, e mesmo com estes dados, destacamos a necessidade de implantação de programas de promoção de saúde e melhores condições de trabalho para estes trabalhadores.

PALAVRAS CHAVE: Motoristas de ônibus, saúde ocupacional e avaliação física.