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STUDY ON OCCUPATIONAL AND NONOCCUPATIONAL RISK FACTORS AND HEALTH OF MOTOR TRANSPORT WORKERS*

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Abstract. The study on work conditions, lifestyle, psychosocial factors and health was carried out in three different urban motor transport companies. 788 workers of the main occupations were interviewed using a questionnaire. The main occupational hazards are low air temperature, draughts, exposure to diesel fuel, cooling oil, noise, vibration, musculoskeletal exertion. Workers do not lead a healthy lifestyle: 46,0 % - are smokers, 83,0% - use alcohol, 53,0 % are physically inactive, 82,0 % lead a malnutrition regimen, 27,0 % experience stressful situations at work every day. Musculoskeletal disorders make up 46,2 %, respiratory 22,2 %, gastrointestinal 17,3 % and central nervous system dysfunction 32,2 %. Musculoskeletal disorders are related to poor ergonomic and workplace design, long working hours, senior age and long professional work experience ($p<0,05–0,002$).

Keywords: motor transport workers, workplace conditions, lifestyle, psychosocial factors, health.

1. Introduction

Work conditions, ergonomic, lifestyle, psychological and social factors have an impact on health, workability, professional reliability of motor transport workers and safety of traffic participants. The main hazards in their job are physical agents – whole body and hand-arm vibration, noise, infrasound, unfavorable microclimate – extreme temperatures, draughts, sun radiation etc., chemical agents are: – carbon monoxide, sulphur dioxide, nitric oxide, aliphatic hydrocarbon, formaldehyde, ozone and etc. [1–3].

Mental and musculoskeletal exertion, eyestrain, also frequent stressful situations are the most influential ergonomic (psychophysiological) factors, affecting health and work capacity. Work safety and health are related directly to lifestyle, nutrition, addictions, and psychosocial factors.

The integrated and prolonged exposure to these factors affects health, workability and professional reliability of motor transport workers. No doubt all this has an impact on traffic safety, increased number of accidents, and develop severe psychological, moral and economical consequences [4, 5].

The analysis of motor transport workers' health status revealed higher frequency of respiratory, musculoskeletal, peripheral nerves, cardiovascular, gastrointestinal diseases. Accident rates are also high [6, 7]. More than 50 % of drivers suffer from musculoskeletal disorders, manifesting in tension, pain, decrease of work capacity [8, 9].

The aim of this study is to investigate occupational, lifestyle and psychosocial factors of motor transport workers and evaluate the relationship between these risk factors and workers health.

2. Study Objectives, Material and Methods:

The study was carried out during the period 2001–2002 in 3 (three) urban motor transport companies, which had 1857 workers in total in 2002.

The specific questionnaire included a documental part, questions on lifestyle and psychosocial risk factors, occupational exposures and health status (all together 78 questions). It was made at Kaunas Medical University, at the Department of Environmental and Occupational Medicine.

1000 workers were recruited for the study and 788 have participated and answered the questionnaire (participation rate 78,8 %) (Table 1).

Physical, chemical and psychophysiological factors at the workplaces were measured and evaluated, following the methodology set by LR Government, Health

* Discussion of results of programme "Transport: technologies, economic, environment, health"

Table 1. Size of occupational groups selected for the study of occupational exposures and health status

Occupation	Number	%
Drivers	371	47,1
Autolocksmiths	100	12,7
Joiner's shop workers	62	7,9
Electromechanics	95	12,1
Others	160	20,3
Total	788	100,0

Ministry, Social Security and Labor Ministry [10].

All the data was computerized and stored in Microsoft Exel 97. Frequency of variables was calculated using Epi Info for Windows statistical program. c^2 test and correlation analysis was made using SPSS statistical program [11].

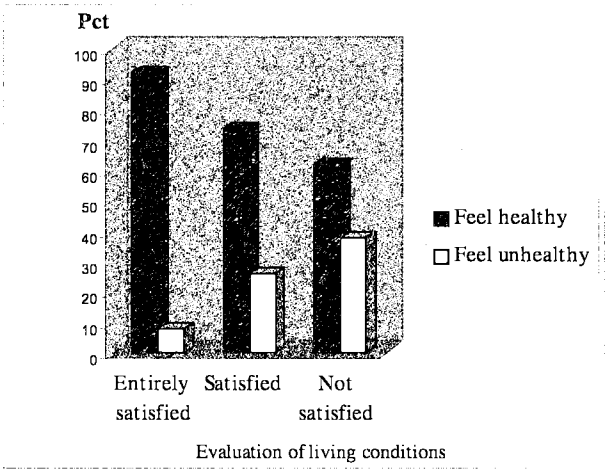

Fig 1. Relation between health status and living condition

3. Results and Discussion

According to the age all motor transport workers were divided into five standard groups. 20-29 y.a. (year age) workers made 9,9 %, 30-39 y.a. – 28,1 %, 40-49 y.a. – 32,9 %, 50-59 y.a. – 24,9 %, over 60 y.a. – 4,2 %. Young and middle age (30-59 y.a.) workers made the absolute majority -85,9 %. 85,4 % of employees were men, 14,6 % - women. Men drivers made up 85,4 %, electromechanic workers – 91,5 %. 6,6 % of all respondents had primary, 31,7 % - specific secondary, 46,0 % - secondary, 11,2 % - got higher and 4,4 % - had university education. 26,6 % of participants had up to 9 year work experience, 30,4 % - had 10-19 year experience, 23,8 % - 20-29 year. 19,1 % of workers had over 30 years total work experience. 59,3 % of drivers mentioned their 10 –29 year total work experience. 78,2 % of employees were married, 12,1 % - single, 9,7 % denoted 'the other' marital status (divorced or living with a partner).

The analysis of psychosocial factors and lifestyle revealed that only 3,8% of all respondents were entirely satisfied with their living conditions.

63,5 % of workers were satisfied; the distribution according to occupation among them was about the same, ranging from 63,0 % – to 70,0 %. Unsatisfied were 32,8 % of the respondents. Those, who were unsatisfied with living conditions, defined their health as " not entirely healthy" or "ill" ($p<0,05$) (Fig 1). 46,0 % of all workers were smokers, 54,0 % - non-smokers. According to the occupation, the majority of smokers were drivers – 47,9 %, 53,1 % - auto locksmiths. Smokers of other professions constituted 32,3 %- 45,0 %. 60,7 % of employees smoke at work, 39,3 % – at home.

83,8 % of participants drink alcohol, 16,2 % - do not use it at all. 14,65% of joiner's shop workers and 14,3 % of auto locksmiths use alcohol several times per week. Only 3,3-6,3% of other professions workers use alcoholic beverages a couple of times a week. 4,61% of participants drinks alcohol once a month. 44,5% - only several times per year. Although the questionnaire was anonymous, we are rather skeptical about the answers of motor transport workers. These results distinctly do not coincide with statistics of alcohol consumption in Lithuania.

Following physical activity tests, it is obvious that, 46,3 % a workers consider themselves as physical active persons. They exercise every day or several times a week, they go in for sports or practice any other kind of physical activity.

The analysis of nutrition questions revealed, that the absolute majority – 83,8 % have meals 2-3 times per day, and 11,8 % - 4-5 times per day, 3,8 % eat only once a day. Dry food with some beverages during lunchtime at the workplace is consumed by 82,5 %, while usual meal (with soup) is taken only by 17,5 % of people. The worst nutrition was of drivers and auto locksmiths. 67,7 % of drivers, 50,0 % of auto locksmiths and 55,5 % of electromechanics workers admitted, that due to specific work-time-schedules and poor menu at the companies bar, they do not have any possibilities for proper daily nutrition regimen.

The lack of sleep was indicated by 31,8 % of all workers: 43,3 % of drivers, 29,3 % of autolocksmiths and 27,3 % of electromechanical workers. Even 20,0 % of employees feel drowsiness, 32,4 % are in a bad mood, 26,2 % - suffer from a frequent headache at work. The relationship between sleep duration, its quality and psycho emotional status at work, is statistically significant ($p<0,001$). Stressful situations at work were experienced every day by 16,2%, several times per week by 21,5% of workers. 27,5% of drivers and 10,2% of joiner's shop workers suffer from stressful situations every day, 25,0% of drivers and autolocksmiths - few times per week (Table 2). Sleep disorders, headaches and bad mood while on the job have a direct relation with a mental stress at work ($p<0,005$).

The analysis of workplace conditions and ergonomic

Table 2. Mental stress at a workplace

Occupation	Frequency of stressful situation		
	Everyday	Few times/ week	Few times/ month
Drivers	27,2 %	25,7 %	47,2 %
Autolocksmiths	7,4 %	24,7 %	67,9 %
Joiner's shop workers	10,2 %	12,2%	77,6 %
Electromechanics	1,4 %	10,8%	87,8 %
All workers	16,2 %	21,5 %	62,3 %

factors showed, that even 75,7 % of workers of the main professions are satisfied, and 17,2 % - are not. The majority of unsatisfied people are among drivers, – (20,3 %) autolocksmiths – 22,2 % and electromechanic workers (17,4%). Microclimate of the workplace (premises), air pollution, noise, vibration, heed strain, long working hours are major factors due to which motor transport workers refer existing work conditions to bad ones. However the subjective evaluation of occupational exposures vary among the professions.

Drivers emphasize harmful factors such as heed and eye strain, workplace microclimate, exposure to chemicals (diesel fuel, cooling oil), noise, vibration and too long working hours. As the most harmful autolocksmiths stress such factors as inappropriate microclimate, noise and exposure to chemicals (Table 3).

The majority of motor transport workers (71,3%) work about 8 h per day, the others (28,7 %) spend more than 8 h at work. Even 60,5% of drivers' workday is longer than 8 h. We found, that over 8 h workday duration was related to negative evaluation of the health status ($p<0,002$), more frequent health complaints ($p<0,05$) and mental stress at work ($p<=0,001$).

Table 3. The most unsatisfactory workplace conditions for the workers of main occupations

Occupation / Workplace conditions	Drivers	Autolocksmiths	Joiner's shop workers	Electromechanics
Day shift	28,3	3,0	9,7	2,1
Evening shift	7,3	0,0	6,5	1,1
Night shift	10,5	1,0	8,1	5,3
Long working hours	34,5	13,0	16,1	24,2
Monotonous work	22,1	8,0	12,9	1,1
Uncomfortable work place	18,3	11,0	9,7	12,6
Heed strain	49,9	18,0	24,2	20,0
Visual intensity	49,1	16,0	22,6	9,5
Hearing intensity	13,7	9,0	3,2	2,1
Noise	31,3	47,0	30,6	27,4
Vibration	45,8	18,0	21,0	7,4
Chemicals, fuels	46,6	45,0	29,0	28,4
Microclimate	47,2	60,0	53,2	41,1

Having analyzed the subjective opinion defining the personal health of 788 motor transport employees, such results were received: 69,9 % thought they had a 'good health', 28,6 % considered themselves as 'not so healthy' and 2,3 % felt 'sick' (Fig 2.). 70,7 % of drivers and 66,0 % of electromechanics defined health status very positively; the worst evaluations were given by joiner's shop/workers (49,1 %) and autolocksmiths (36,4 %). During the last one year period, 39,0 % of motor transport employees visited a doctor (except dentist) once 51,0 % made a visit twice, 10,0% - three or more times. The aim of the study of motor transport workers health problems concerning the most frequent and health disorders complaints was to define a possible relation between the occupation and manifestation of impact of occupational exposures.

Even 32,7 % of employees had various symptoms of CNS disfunction (headache, sleep disorders, drowsiness at work). 19,6 % suffered from hypertension (high blood pressure). 22,7 % of respondents denoted cough problems and bronchitis. A significant relation ($p<0,004$) was found between respiratory symptoms and drivers and autolocksmiths. 17,3 % of drivers had gastrointestinal disorders (heartburn, gastritis). Among all motor transport professions even 63,3 % of drivers had a significantly higher ($p<0,05$) number of musculoskeletal problems (neck, back, waist pain). CNS dysfunction among drivers (53,1%) was also more frequent ($p<0,05$) (Table 4).

We asked all the workers "which symptoms of health disorders or ailments you relate to workplace conditions". 17,4 % of all workers and 26,7 % of drivers affirm, that all 'cold' diseases, common cold and bronchitis, are linked with the conditions at work. 23,0% of all transport workers and 37,5 % of drivers noted, that neck, back and waist pains are related to job task and poor ergonomical workplace design ($p<0,002$). The analysis showed, that there is a statistically significant association between the frequency of back and waist pain and human age and total work experience (Fig 2).

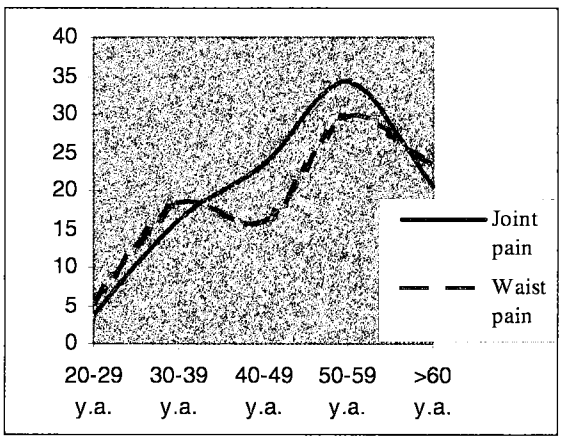

Fig 2. Prevalence of joint and waist pain in diferent age groups

Table 4. Comparison of some health problems of workers of the main occupation

Occupation / Complaints	Drivers	Autolock-smiths	Joiner's shop workers	Electro-mechanics
Headache	18,6*	13,0	16,1	13,7
Sleep disorders	20,2	10,0	21,0*	4,2
Drowsiness at work	14,3*	2,0	9,7	3,2
Hypertension	21,9	17,0	14,5	20,0*
Cough, bronchitis	26,1*	30,0*	16,1	16,8
Gastrointestinal problems	17,3*	14,0	6,5	9,5
Neck pain	11,3	9,0	6,5	8,4
Back pain	25,6*	16,0	25,8*	13,7
Waist pain	26,4*	14,0	14,5	13,7

* - $p < 0,05$ comparing with other occupations

Headaches and gastrointestinal disorders were more frequent among drivers; the result was statistically significant ($p<0,002$). These health problems could be caused by irregular, dry food, malnutrition, smoking and other risk factors characteristic for this type of workers. There is a statistically significant relation between driver's profession and mental stress experienced every day ($p<0,004$).

4. Conclusions

1. The lifestyle of the motor transport workers is not healthy: 46,0% are smokers, 83,8% are drinkers, 52,8% are physically not active, 82,5% have irregular, insufficient alimentation, 31,8% lack sleep, 27,0% of drivers experience stressful situations at work every day.

2. The most hazardous factors according to the workers are low ambient temperature, draughts, exposure to diesel fuel and cooling oil, noise, vibration, heed and musculoskeletal exertion.

3. 31,0% of the motor transport workers have health problems. Musculoskeletal problems prevail among them (46,2%), followed by respiratory (22,7%), gastrointestinal (17,3%) and central nervous dysfunction (32,7%).

4. Study results show, that there is a statistically significant relation between driver's, workshop, worker's occupation, poor ergonomics, elder age and great work experience and musculoskeletal disorders ($p<0,02$-$0,002$). Respiratory and gastrointestinal disorders are significantly more common among drivers and autolocksmiths ($p<0,05$-$0,002$).

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