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Health survey of professional drivers

by Ann-Lis Backman, MD

BACKMAN A-L. Health survey of professional drivers. *Scand j work environ health* 9 (1983) 30-35. A cross-sectional health survey comprising 633 male drivers showed that the frequencies of some complaints, for instance, pain in the shoulders and in the back of the neck, increased in older age groups. The frequencies of elevated blood pressure and electrocardiographic findings, on the other hand, tended to decrease among the older drivers. The percentage of drivers who had met with some kind of accident decreased among drivers aged 45-54 years. It was assumed that the results point toward health-based selection. The rate of turnover and its causes were studied in a cohort of 1,597 drivers. The results of the turnover study supported the findings of the health survey.

Key terms: cross-sectional health survey, selection, turnover.

During the last decade attention has been paid to the health hazards, such as vibration and noise, of driving heavy motor vehicles. The health problems in transport work have been studied in many countries. Several of the studies have been performed in the Scandinavian countries, where the environmental and traffic conditions are very much alike (1, 4, 5, 8, 9, 10, 11, 12, 14, 21). These have been mostly questionnaire studies.

In Finland an investigation carried out in 1979-1980 included both a health screening and an inquiry about the work conditions of active drivers. In addition a retrospective cohort study concerning turnover among professional drivers was undertaken. The health screening program was put together on the basis of the symptoms of drivers reported in earlier investigations. The following five target groups were selected: local bus drivers, long-distance bus drivers, stock delivery drivers, truck drivers, and tank truck drivers. All the drivers were members of the Finnish Transport Workers' Union. In the absence of a suitable reference group, reciprocal comparisons between the target

groups were suggested. A cross-sectional health survey may, however, give too favorable a picture of the health status of drivers as an occupational group. In order to determine whether drivers leave the occupation for health reasons, the rate of turnover and its reasons were studied among subjects who had been working as professional drivers in 1969 and who had joined the trade union about the same time. The aims of the project were to investigate the health hazards of professional drivers in the trade of transport, to clarify the physical and mental demands and the stress factors connected with the work, and to determine the factors which affect occupational turnover in these occupations.

Subjects

A total of 633 male drivers from 35 enterprises in six different municipalities in Finland participated in the health screening. They had all joined the trade union between 1967 and 1972 and had been working at the same task from 1969 to 1979. For practical reasons (ie, the arrangement of work shifts) the drivers were collected from enterprises with at least five employees. The participants included 165 local bus drivers, 122 long-distance bus drivers, 154 stock delivery drivers, 159 truck drivers, and 33 tank truck drivers.

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The mean age of the drivers was 43 years, and the range 30–54 years. The long-distance bus drivers were the oldest (mean age 46 years), and the tank truck drivers the youngest (mean age 38 years). The rate of turnover and its reasons were studied in a cohort of 1,597 male drivers who joined the trade union between 1967 and 1969. The drivers were from the same municipalities as those who participated in the health screening. Union members who had worked only a short time (2–3 months) as professional drivers were excluded. At the time of the inquiry 73 men of the selected cohort were dead, 47 were living abroad, and the whereabouts of 24 subjects were unknown. The inquiry was sent to 1,453 subjects. The cohort included 67 drivers who participated also in the health screening. The mean age of the drivers was 29 years in 1969, and the cohort mainly included drivers aged 20–39 years. The follow-up comprised the period from 1969 to 1979.

Methods

The *health screening* was carried out between November 1979 and February 1980. The participants filled out a questionnaire concerning their health beforehand. At the health screening, the receptionist checked the answers, and the questionnaire was completed if necessary. The questionnaire included questions about earlier diseases; accidents (the kind of accident was not asked, nor when it happened); present state of health; back trouble ("Do you often have back trouble?"); stomach symptoms (diarrhea, constipation, dyspepsia, stomachache) experienced during the last year; neck, shoulder and limb symptoms (aches, stiffness, tiredness) experienced during the last month; chest pains, according to the London School of Hygiene questionnaire (20); respiratory symptoms (20); and smoking habits. The health screening program consisted of the following measurements: height and weight, resting electrocardiography (Elema mingograph 34, 4 channels), blood pressure (Elag Köln BE 107), sight screening (sight screener 18010 A), audiometric screening (Maico 20 audiometer), and field of vision (Aimark projection perimeter). The electrocardiograms were interpreted by a cardiologically orientated specialist in internal medicine,

the results from the sight screening and the field of vision measurements by an ophthalmologist, and the audiograms by an otologist. In addition, a special back investigation was carried out. The results are reported elsewhere (7).

The *turnover* data were collected by means of a postal inquiry. The drivers were asked what task they performed at the time they joined the trade union, what sort of work they had done since 1969, and, if they had left the occupation, the reason for leaving. There were also some questions concerning possible diseases, early retirement, and the reason for retiring.

In October 1980 the first 500 questionnaires were sent to those drivers who were still members of the union and whose addresses were therefore known. The remaining drivers were traced through different population registers, and the last questionnaires were mailed in August 1981. The inquiry was sent to 1,453 drivers, including 67 drivers who also participated in the health screening. Half of them responded within a month. A reminder was mailed to the drivers who had not answered after a month. In all, 1,156 drivers (80 %) responded. The proportion of non-respondents was highest (26 %) in the youngest age group (30–34 years in 1979) and lowest among subjects aged 50–54 and 40–44 years (15 & 17 %, respectively).

Results

The *health inquiry* showed that the most common health problem was shoulder and back pain. About 70 % of the drivers had suffered from pain in the shoulders and the back of the neck during the last month. The symptoms were in the left shoulder more often than in the right. In all, 40 % of the drivers had often had back trouble, about 20 % had hypertension, and 8 % had sometimes had a gastric ulcer. Dyspepsia and stomachache were common complaints during the last year; about 35 % of the drivers reported some sort of stomach symptoms. Accidents had happened to 33 % of the drivers. The kind of accident was not asked, nor when it happened. The bus drivers had the most back trouble, hypertension, and stomach ulcers; the truck drivers had had comparatively more accidents. The prevalences of shoulder and back pain and of

hypertension increased with age (fig 1). The frequency of gastric ulcer increased until the age of 40–44 years, after which the increase ceased. The percentage of drivers who had met with some kind of accident showed a similar pattern and even tended to decrease among drivers aged 45–54 years (fig 2). The frequency of undefined chest pain reported by the drivers was about 10 % smaller in the younger age groups than the corresponding frequencies of the general population

Fig 1. Age-specific prevalences of shoulder pain during the last month, often occurring back pain, manifest hypertension, and stomach ulcer among drivers.

Fig 2. Age-specific percentages of drivers who had met with some form of accident.

(19). The frequency of chest pain in the general population tends to increase in the older age groups, but there was only a slight increase among the older drivers. The frequency of chest pain among drivers aged 45–49 years was even 30 % lower than the frequency reported for the same age group of the general population. The frequency of typical angina pectoris, on the other hand, was as high as that of the general population, and it was the highest among drivers aged 45–49 years (fig 3). The bus drivers had the highest frequency (3 %) of angina pectoris.

The *health screening* revealed pathological changes among 60 % of the participants. The most common findings were visual defects (43 % of the drivers). In all, 25 % of the drivers had defective near vision, 24 % had defective distant vision, and in 19 % depth perception was below average. Some of the drivers had more than one visual defect. Only 1 % had defective color vision, and there were no notable limitations of the field of vision. About 13 % of the drivers had a hearing defect, ie, their hearing in the range of speech perception (500–1,000–2,000 Hz) was poorer than 20 dB in one ear or the other. About 20 % of the drivers had elevated blood pressure [systolic pressure ≥ 160 mm Hg ($\geq 21,331.52$ Pa) and/or diastolic pressure ≥ 100 mmHg ($\geq 13,332.2$ Pa)]. In all, 83 % of the drivers had a perfectly normal electrocardiogram, 15 % had small, insignificant changes in their electrocardiograms, and 2 % (11 drivers) were referred to a physician for closer examination, diagnosis, and treatment. Of the eleven drivers, five had hypertension and corresponding changes in their electrocardiograms, one had frequent ventricular extrasystolic beats, one had bradycardia and negative T-waves, and four had bundle branch blocks. The stock delivery drivers had the highest frequency of positive screening tests and, correspondingly, the highest percentage of persons referred to further clinical examination. Defective vision was more common in the older age groups than in the younger ones. Likewise, the prevalence of hearing defects increased from 8 % in the youngest age group to 17 % in the drivers aged 50–54 years. The prevalences of elevated blood pressure and of electrocardiographic changes tended, on the other hand, to decrease for

drivers aged 50–54 years, as depicted in fig 4.

The results of the *turnover study* showed that early retirement usually started among drivers aged 45–49 years. The frequencies increased steadily in the older age groups, as shown in fig 5. Of the 1,156 drivers who answered the turnover questionnaire, 66 had retired because of disability. The most common reasons for early retirement were cardiovascular disease (29 cases), back symptoms (18 cases), and disability following some accident (10 cases). Some of the drivers mentioned more than one disease. Thus five subjects reported asthma, five listed stomach symptoms, four included rheumatic

trouble, and four had mental disease. There were also some cases of visual and hearing defects, diabetes, anemia, cancer, and epilepsy.

Discussion

The bus drivers had the highest frequencies of anamnestic back trouble, stomach ulcer, hypertension, and angina pectoris. These ailments have often been interpreted as signs of mental strain. According to the drivers' opinions of their work conditions the bus drivers experienced considerable mental strain (7). The truck drivers had had comparatively more

Fig 3. Age-specific frequencies of undefined chest pain and typical angina pectoris symptoms among drivers.

Fig 4. Age-specific frequencies of visual and hearing defects, elevated blood pressure, and electrocardiographic findings among drivers.

Fig 5. Frequency of early retirement among drivers according to retirement age.

accidents, which is understandable because they drive the longest distances. The stock delivery drivers had the highest frequency of positive screening tests, and they also had the heaviest work physically (7).

The most common complaints among the drivers were shoulder and neck pain and back trouble. Ergonomic factors concerning work posture and movements will probably explain the high frequencies of back and shoulder complaints. The fact that the symptoms were more often in the left shoulder than in the right may be due to draft from the left window in the drivers' cabin. Irregularly eaten and unsatisfactory meals, as well as tight time schedules and traffic stress, may cause stomach trouble (16).

The frequencies of earlier diseases, accidents, and current complaints are usually higher in older age groups. Furthermore in earlier health surveys performed with the same methods and with the same specialists as interpreters of the results, the frequencies of positive screening tests have generally been higher among older participants (3,6). Among the drivers the frequencies of shoulder and back trouble, for instance, were clearly higher in the older age groups. Furthermore the frequency of angina pectoris was highest among drivers aged 45–49 years. The drivers under the age of 45 were, however, obviously more prone to accidents than those aged 45–54 years. The results of the health screening showed that the frequencies of visual and hearing defects increased in the older age groups, but the frequencies of elevated blood pressure and electrocardiographic findings increased until the age of 45–49 years and decreased thereafter.

The results seem to suggest a health-based selection among the drivers, the critical age being 45–49 years. At this age, for instance, the most accident-prone drivers have probably left the occupation. The drivers may have minor complaints which grow more common in the older age groups, but serious symptoms tend to put an end to driving as an occupation (16, 17, 22). The frequencies of angina pectoris and the results of the health screening point to cardiovascular symptoms as a possible reason for leaving the occupation. The selection

theory was in some degree supported by the results of the turnover study. Cardiovascular disease appeared to be the most common reason for early retirement, and back trouble the second most common.

Early retirement tended to start among drivers aged 45–49 years, ie, the age group with the highest frequencies of cardiovascular symptoms. Drivers who perished in accidents or from other external causes were mostly younger than 45 years of age (7), a finding which agreed with the results of the inquiry connected with the health screening, ie, accidents were less common among older drivers than among younger ones.

It is well known that, as a result of health selection, a cross-sectional study usually depicts active working groups as healthier than the general population (2, 3, 13, 15, 17, 18). In the case of the present study, the oldest age group (50–54 years) seemed less accident-prone and more free from cardiovascular symptoms than the younger drivers. The findings can be interpreted as the result of a possible health-based selection. Such a selection suggests that the physical and, probably, the mental demands connected with the occupation are rather high. The results from the health screening combined with the data from the turnover study brought forth cardiovascular disease, back trouble, and accidents as the most serious health problems of professional drivers.

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