

Stress at work in open urban population of different age and gender groups

A.M. Akimov^{1,2*}, V.V. Gafarov², V.A. Kuznetsov¹

¹ Tyumen Cardiology Research Center, Tyumen, Russia, Tomsk National Research Medical Center, Tomsk, Russia

² Research Institute of Therapy and Preventive Medicine, Novosibirsk, Russia.

Authors

Alexander M. Akimov, M.D., Ph.D., researcher, Laboratory of Epidemiology and Prevention of Cardiovascular Diseases (Tyumen Cardiology Research Center, Tyumen, and National Research Medical Center, Tomsk), Interdepartmental Laboratory for Epidemiology of Cardiovascular Diseases, Research Institute of Therapy and Preventive Medicine, Novosibirsk, Russia

Valery V. Gafarov, M.D., Ph.D., doctor of sciences, head of Interdepartmental Laboratory for Epidemiology of Cardiovascular Diseases, Research Institute of Therapy and Preventive Medicine, Novosibirsk, Russia.

Vadim A. Kuznetsov, M.D., Ph.D., doctor of sciences, head of the Department of Instrumental Diagnostics, Tyumen Cardiology Research Center, Tyumen, Russia.

Objective. *To study the prevalence of certain stress parameters in a workplace in men and women aged 25–64 years of open urban population in Tumen.*

Materials and methods. *The study was based on cardiological screening among a representative sample of population, the response amounted to 77.7%. The sample of 2000 people was taken from the electoral lists of one of the administrative districts of Tumen and divided into four groups of different age and gender (25–30, 35–44, 45–54, 55–64 years), consisted of 250 persons each. Stress at work was determined using the WHO MONICA psychosocial questionnaire.*

Results. *The results of investigation showed that changes in working specialties were more common in men aged 25–34 and 35–44 years compared to women of the same age. Elder men had significantly less side work compared to younger age groups, it is remarkable that men of elder age significantly diminished the amount of side work compared to women of the same age.*

Conclusion. *The results obtained in this study conducted in unorganized population of Tyumen may be used as the scientific basis for organizing complex socially oriented preventive programs in other moderately urbanized*

Siberian cities with the main focus on the needs of risk groups — men of young and elder age and women aged 45–54 years.

Keywords: *stress at work, open urban population, gender differences.*

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Many researches have shown, that sometimes every person undergoes stress at work, which is accompanied by many negative factors, such as overwork, physical weakness, loss of concentration, and loss of control. Every specialist has different reaction to stress. It depends on person's character, changes in the workplace, job satisfaction, amount of responsibility during work [1, 2, 3, 4].

According to a global study by World Health Organization, every fourth employee (23%) has five or more symptoms of depression, only 14% are truly involved at work and only 12% show general optimistic attitude. 92% of research participants admitted, that their psychological state is determined by the results of their work, and not by internal resources, such as, for example, self-reliance [5, 6]. The problem of stress exists in all countries. Thus, in the United States, 20% of the costs and losses, which are associated with staff turnover, absenteeism, resistance to organizational changes and productivity decrease, are caused by professional neuroses and stresses. Americans claim, that damage from stress factors is about 500 million dollars a year. 33% of Canadian employees reported, that they had to take days off at their own expense, because they felt exhausted. Another 27% would do the same, if they were not afraid to lose their job [5, 7].

According to analysts, every third worker at least once a week experiences severe stress in Russia, and 13% of workers have stress almost every day, and despite this fact, not enough attention is paid to the problem of stress at work nowadays. This leads to a decrease in economic efficiency of the organization, industry in general, and, ultimately, of the government's work. First of all, it is necessary to carry out preventive measures aimed at creating positive work environment for the prevention of occupational stress. Thus, it will increase the productivity and efficiency of employees.

Chronic or acute psycho-emotional stress is the central link in psychosomatic relationships. On the one hand, it connects psychological and social adverse factors and, on the other hand, it also connects

psycho-physiological processes, which are involved in pathogenesis of cardiovascular diseases (CVD). Stress at work is one of the most important factors of chronic social stress in working population together with the stress in family, however, gender differences of stress at work in Russian populations are not studied enough, which makes planning and control of preventive measures effectiveness more difficult. The realization of these tasks can be more effective by taking into account the gender characteristics and their prevalence in the population.

The objective of this study was to determine the prevalence of certain stress parameters in a workplace in men and women aged 25–64 years of open urban population in Tyumen.

Materials and methods

The study was conducted in the framework of cardiological screening among men and women aged 25–64 years belonging to the open urban working population of Tyumen. A representative population, that involved 2000 participants, was taken from the electoral lists of one of the administrative districts of Tyumen, and included 250 men and women of each age group (25–34, 35–44, 45–54, 55–64 years), the response amounted to 77.7%.

Questioning of participants was conducted using WHO-MONICA psychosocial questionnaire «Knowledge and attitude towards their health» [8]. Questions of the questionnaire were accompanied by a list of fixed answers, from which the respondents could choose the most correct answer, by their opinion.

Statistical analysis was done using SPSS 11.5 Statistics, Statistica 7.0 software and Microsoft Excel spreadsheets, according to the methods of variance statistics.

In order to conduct correct comparative analysis with the results of other epidemiological studies, we performed standardization of variables using direct standardization method. To standardize obtained data during analysis we used the age structure of Russian urban population between 25 and 64 years.

The research data for categorical variables are represented in fractions (percent) for eight groups in general for men and women, divided by age, gender and by decades of life. Pearson’s chi-squared test was used to determine the statistical significance of the results between different groups. Bonferroni correction was used to eliminate the problem of multiple comparisons, i.e. eliminate type I error (conclusion, that groups have differences, when they actually do not) during paired comparing of average values between four or more independent groups.

Results

There were no statistically significant differences, when answering the question «Do you like your work?» depending on age in men and women of open urban population aged 25–64 years.

Changes in working specialties over the last 12 months were significantly more common in men aged 25–34 and 35–44 years compared to women of the same age groups: 25–34 years (47.7% — 35.2%, p<0.05) and 35–44 years (43.4% — 29.5%, p<0.01). Statistically significant gender differences were determined in a general population (ASV: 41.2% — %, p<0.01).

Statistically significant differences in men subpopulation were determined when answering the question «Did your workload change over the last 12 months?». Thus, men aged 55–64 years answered «I started doing additional work» significantly less frequently compared with men of different age groups (25–34 years: 16.4% — 40.9% p<0.001), (35–

44 years: 16.4% — 38.3% p<0.001), (45–54 years: 16.4% — 32.0% p<0.001), and with general men subpopulation aged 25–64 years (16.4% — 31.6%, p<0.001). Meanwhile, men aged 55–64 years did significantly less additional work compared with women of the same age (16.4% — 29.0%, p<0.01). Another answer «I stopped or started doing less additional work» was more common in men aged 55–64 years compared with men of other age groups (25–34 years: 36.9% — 18.8% p<0.001), (35–44 years: 36.9% — 18.5% p<0.001), (45–54 years: 36.9% — 11.7% p<0.001) and with general men subpopulation aged 25–64 years (36.9% — 21.3%, p<0.001). Men aged 55–64 years started doing less or stopped doing additional work compared with women of the same age group (36.9% — 20.1%, p<0.001). Statistically significant gender differences were determined, when answering the question about changes in workload over the last year in the age group of 45–54 years: 11.7% — 22.5%, p <0.01 of men and women, respectively, answered «I started doing less or stopped doing additional work»; and 56.3% — 40.0%, p<0.01 answered «It didn’t change» (table 1).

Consequently, current study has shown, that changes in working specialties were more common in men aged 25–34 years and 35–44 years compared with women of the same age. Elder men had significantly less side work compared to younger age groups, it is remarkable that men of elder age significantly diminished the amount of side work compared to women of the same age.

Table 1. **Stress at work in open urban population of different age and gender groups**

Question / Attitude	Age groups (years)										
	25-34		35-44		45-54		55-64		25-64		ASV
	Abs	%	Abs	%	Abs	%	Abs	%	Abs	%	%
1. Did your specialty change over the last 12 months?											
Yes	84/43	47.7/35.2*	99/61	43.4/29.5**	81/64	35.1/40.0	77/65	36.0/30.4	341/233	40.2/33.1	41.2/33.8**
No	92/79	52.3/64.8	129/146	56.6/70.5	150/96	64.9/60.0	137/149	64.0/69.6	508/470	59.8/66.9	58.8/66.1
2. Did your workload change over the last 12 months?											
I started doing additional work	72/45	...40.9/36.9	87/78	...38.3/37.7	74/60	...32.0/37.5	35/62**	16.4/29.0	268/245	...31.6/34.9	34.0/35.6
It didn't change	71/55	40.3/45.1	98/92	43.2/44.4	130/64	56.3/40.0**	100/109	46.7/50.9	399/320	47.0/45.5	47.1/45.0
I stopped or started doing less additional work	33/22	...18.8/18.0	42/37	...18.5/17.9	27/36	...11.7/22.5**	79/43	36.9/20.1**	181/138	...21.3/19.6	19.5/19.4

Comment: 1. Significance of differences between men and women is signed with (*) in the upper right corner of the table cell statistically; 2. Significance of differences between men of different age groups and men aged 55–64 years is signed with (*) in the lower left corner of the table cell; * — p <0.05; ** — p <0.01; *** — p <0.001; 3. ASV — age-standardized variable.

Discussion

The problem of stress prevention and management has been studied for more than 40 years in economically developed countries. American researchers were the first ones who noticed the problem of stress. The statistics on how much stress affects American society was published at the end of the last century in the US. They noticed that the reason for chronic colitis in 90% of people was stress. Heart attacks and other cardiovascular diseases, in the development of which stress is the main factor, are the cause death in 50% of cases in the US. The increase of stress pressure has been noticed by the scientists and clinical practitioners of different specialties in Russia and other countries [8, 9, 10]. The influence of social stress factors, including stress at work, on the cardiovascular risk and prognosis was mentioned by the European society of cardiology in 2012 for the first time in their guidelines on CVD prevention in clinical practice, and in 2016 the influence of stress on CVD prevention was reported [11].

The results of the current study are reasonable according to previous data on conventional and non-conventional CVD risk factors in Tyumen population. Thus, open urban male population aged 25–64 years had a decrease of positive attitude to its health, tendency to increase of complaints, and responsibility for maintenance of their health [12, 13], what could be the reason for the tendency of workload decrease in elder men. Furthermore, Tyumen men aged 25–64 years had tendency to increase of personal anxiety, depression, sleep disturbances, hostility and exhaustion with the increase of age, and reached maximum at the age of 55–64 years, that undoubtedly resulted from the stress levels in the studied open population.

According to another study in Tyumen population, senior positions of women and hard physical labor of men and women had the highest impact on cardiovascular mortality [16]. Thus, additional work in women, as the stress manifestation in the workplace, is probably a negative factor, which can influence attributable and relative CVD risk and mortality in women.

Conclusion

The results obtained in this study conducted in unorganized population of Tyumen may be used as the scientific basis for organizing complex socially oriented preventive programs in other moderately urbanized Siberian cities with the main focus on the needs of risk groups—men of young and elder age and women aged 45–54 years.

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References

1. Akimov A.M. Job stress and social support in the open male population. *Theory and Practice of Social Development*. 2014; 2014; 1: 92–95. Russian.
2. Mitchenko E.I., Mamedov M.N., Kolesnik T.V., Deev A.D. Cardiovascular risk in an urban population in Ukraine. *International journal of heart and vascular diseases*. 2014; 2: 16–24. Russian.
3. Boytsov S.A. Mechanisms of reduction in coronary heart disease mortality in different countries of the world. *preserving medicine. Preventive medicine*. 2013; 5: 9–19. Russian.
4. Akimov A.M., Smaznov V.Yu. Attitude to health in open urban male population depending on age. *Omskiy Nauchny Vestnik*. 2015; 4 (141): 282–284 Russian.
5. WHO Regional Office for Europe. Quantification of healthy life years lost in Europe. 2011. Available at: URL: <https://goo.gl/iES4Yb>.
6. Silin A.N., Volosach A.O. The regulation of public health in Tyumen region. *Academic Newsletter* 2015; 2 (32): 148–152. Russian.
7. Silin A.N., Koval`zhina L.S. Healthy Lifestyle in the Tyumen Region. *Vestnik instituta sotziologii* 2017; 2 (21): 96–107. Russian.
8. Gafarov V.V., Gromova E.A., Gagulin I.V., Gafarova A.V. Effects of stress on risk of arterial hypertension in general male population of 25–64 years old: 14 years of follow up (epidemiological study on the basis of the WHO programm «MONICA—PSYCHOSOCIAL»). *Arterial'naya Gipertenziya*. 2013;19 (1): 27–31. Russian.
9. Mulerova T.A., Maksimov S.A., Ogarkov M.Yu. Comprehensive assessment of cardiovascular risk factors of arterial hypertension in indigenous and non-indigenous inhabitants of Mountain Shoria. *Sistemnie gipertensii*. 2017; 1:17–22. Russian.
10. O'Donnell M.J., Chin S.L., Rangarajan S. et al. Global and regional effects of potentially modifiable risk factors associated with acute stroke in 32 countries (INTERSTROKE): a case-control study. *Lancet*. 2016;388:761–775.
11. European recommendations for the prevention of cardiovascular diseases in clinical practice (revision 2016). *Journal of Cardiology*. 2017; 6 (146): 785. Russian. doi: 10.15829/1560-4071-2017-6-7-85.
12. Smaznov V.Iu., Kaiumova M.M., Akimova E.V. et al. Awareness and attitude to its health and prevention in a male Siberian population. *Profilakticheskaya meditsina*. 2011; 4: 24–27. Russian.
13. Akimov A.M. The ration of men to health: educational preferences. *News from Higher Educational Institutions. Sociology. Economics. Politics*. 2013; 4: 50–52. Russian.
14. Kayumova M.M., Akimova E.V., Gafarov V.V. et al. A life-exhaustion: interrelation with the prevalence of ischemic heart disease. *Russian Journal of Cardiology*. 2014; 8 (112): 68–72. Russian.

15. Kayumova M., Gorbunova T., Gakova E., Akimov A. The frequency of association of somatic risk factors for coronary heart disease and trait anxiety in men. *Vrach.* 2018; 4: 40–43. Russian.
16. Akimova Y.V., Smaznov V.Y., Kayumova M.M. et al. The cardiovascular mortality in Tyumen cohort depending on social gradient // *Social hygiene.* 2008; 6: 6–9. Russian.