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## PECULIARITIES OF ADAPTATION REACTIONS IN FEMALE MIGRANTS AND HEALTH DISORDERS RISKS OCCURRING AFTER DIFFERENT PERIODS OF STAYING ON MOSCOW REGION TERRITORY

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*The article gives the results of determining peculiarities which are characteristic for adaptation in female migrants depending on a period of their staying in Moscow region. Adaptation was assessed as per variants of functional stress status and functional abilities of circulatory system. We detected that female migrants during their adaptation to impacts exerted by neuro-emotional factors, social-psychological factors, and physical (muscular) loads which varied in their intensity and length, had signs of stress syndrome. This syndrome was apparent through physiological parameters, namely increase in index of functional changes in circulatory system, and changes in heart rate variability as per regulatory systems activity parameter (PARS).*

*If female migrants stayed in Moscow region for less than 3 years than the most specific weight of migrants with unsatisfactory adaptation was detected among Russians and it was equal to 36.04%; adaptation mechanisms were strained among Tadjiks women (62.08 %). If they stayed for longer than 3 years, then unsatisfactory adaptation parameter grew among Tadjiks women by 12.4 % and it indicated that the body's functional reserves were mobilized and it could lead to adaptation failure. When adaptation was satisfactory,  $\beta$ -adrenoactivity of erythrocytes membranes was within the physiological changes standards regardless of a period of staying. When adaptation mechanisms were strained and adaptation itself was unsatisfactory, the greatest growth in this parameter was detected among Tadjiks women in any period of staying.*

*Preservation of female labor migrants health and prolongation of their working capacity period requires a system of medical and social support. Activities aimed at primary prevention of health disorders should include general physical training, tempering, autogenous training, and elimination of hazardous communal and occupational risk factors. Secondary prevention activities are systematic medical surveillance over migrants' health, including preliminary and periodic medical examinations.*

**Key words:** adaptation, female migrants, period of staying, Moscow region, risks prevention, circulatory system, heart rate variability.

Today the International Organization for Migration committee has data on about 300 million migrants all over the world (3% of the total world population). As per data given by the Federal Migration Service, 9.2 million migrants were in the Russian Federation territory in 2015; 5.2 million of them registered them-

selves, found a job and a place to live permanently. Quantity of migrants is going to grow in the nearest future. About three quarters of the total labor migration are labor migrants who come to Russia from the CIS countries. The migration problem is vital for the Russian Federation as our country remains one of the

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most economically developed one among post-Soviet states, and social and political situation in it is stable. And also there is demand for additional labor resources in Russia [9]

"Migration" and "adaptation" concepts are very close in many aspects. The very situation of changing a place of long-term (or even permanent) residence requires adaptation to new conditions, as well as partial or total integration into new environment [1, 2, 5, 16, 17, 18]. Poor knowledge of a language, laws, and existing behavioral patterns, differences in values and goal-settings etc. lead to stress involvement both for migrants themselves and for a territory which accepts them [11, 13–17].

There are other stress-causing factors which can be related to social aspects or occupational environment and labor process; each such factor can appear in case of migrants involved in various labor processes. Thus, social status of many migrants is substantially lower than that they used to have in their home country. Immigrants often can get only unskilled jobs on the Russian labor market which are practically of no interest to local population [5, 6]. It is often next to impossible to find a full-time job. Consequently, a number of research revealed that only 43.55% female migrants had regular jobs. A number of migrants actively involved in various labor processes goes down by the end of the third year of their staying in a receiving country regardless of their sex; it proves there are difficulties that migrants have in adapting to a new environment [7]. Migrants-refugees from hot points and places where nationalistic and ethnic conflicts appear are the most poorly adapted to living in new conditions in Russia [5, 13, 14]

But still labor migrants from former USSR republics are in high demand in a number of labor spheres. Women as a rule are employed in social services (as child-minders, as nurses for old people and disabled people). The results of the research performed by Marketing Research Center in 2013<sup>1</sup>, revealed that

female migrants involved in housekeeping had a very closed lifestyle and it made their adaptation and integration very difficult and complicated. About one third of them (33%) contacted migrants more often than local population [11]. And as their communication was limited to their families and countrymen it led to psychological and social complications.

This problem is not exclusively Russian. Scientists all over the world examine how depression and stresses in migrants evolve and how to prevent them [13–18]. For example, E. Hansen et al. (2003) detected that each fourth farmer-migrant in the USA had one or several psychological disorders such as stress, depression, or anxiety. The situation of migration itself stimulates stresses especially in cases when migration is forced; it determines the necessity to detect basic health risk factors and to search for mechanisms of adaptation to new life and working conditions.

The latter determined **our research goal** which was to reveal peculiarities of adaptation process in female migrants on the basis of quantitative estimation of physiological costs which they had to bear in labor processes with substantial physical and neuro-emotional loads in order to work out prevention activities of medical and social support.

**Data and methods.** To study adaptation mechanisms, we examined women of fertile age (20-39) from three groups (Russians, Armenians, Tadjiks) with different period of staying on Moscow region territory: less than 3 years and longer than 3 years. Women worked in social services sphere as housemaids, nurses, and child-minders; they were examined allowing for impacts exerted by labor process factors and levels of physical and neuro-emotional loads.

A complex examination of migrants as per a conventional scheme was performed in Migration Service Center, Moscow regional office, and included medical documents analysis and questioning. To perform physiological research, we chose practically health people as

<sup>1</sup> Materials of the research performed by Marketing Research Center «Housekeeping workers in Russia and Kazakhstan», supported by the UN in 2013.

per data of preliminary medical examinations. Our research included job analysis allowing for labor hardness and labor intensity in conformity with P 2.2.2006-05 [12]. Physiological research was aimed at studying neuro-muscular system functional state as per arm and backbone dynamometry parameters (strength, endurance, and maximum muscular capacity). Besides, physiological research included standard comparative analysis of heart rate variability [4], blood pressure measuring, heart rate, index of functional changes in circulatory system as per R.M. Baevskiy [10]. The obtained physiological research results were assessed in conformity with methodical guidelines on physiological standards of a human body stress [8] and methodical guidelines by R.M. Baevskiy on heart rate variability analysis [4].

Adaptation reactions were studied on the basis of physiological techniques with detecting index of functional changes in circulatory system and special examination of  $\beta$ -adrenoreactivity of blood erythrocytes membranes. Three different states were outlined: satisfactory adaptation, adaptation mechanisms strain, and unsatisfactory adaptation.

Social conditions were assessed with the use of WHO questionnaire adapted for the tasks set by our research. The obtained data were processed with the use of Statistika software package.

**Results and discussion.** Job analysis revealed that female migrants working as housemaids had the following most substantial factors which made their labor hard: a lot of stereotype movements, working posture (which was uncomfortable for up to 50% of the total working time), body bendings (up to 300 during a working shift), movement in space (up to 12 km). The overall housemaids labor assessment allowed to rank it as having 3.2 hazard class. As for nurses, the most adverse labor factor for them was a lifted cargo mass (up to 65 kg), and their labor conditions class as per labor hardness was also 3.2. Total cargo sum which was moved during each hour of a working shift was the most adverse labor factor for child-minders, and overall labor hardness for them was assessed as 3.2.

Neuro-emotional loads for female migrants were determined by psychophysiological peculiarities of labor within "human - human" system where labor of the first group was aimed at serving the needs of the second one. All the occupational groups of female migrants had such factors in their labor intensity (class 3.2) as emotional loads related to responsibility for other people's safety, significance of any mistake, a quantity of conflicts arising out of their job responsibilities, and regime loads related to irregular working hours, absence of days off and holidays, and necessity to work at night.

Job social and psychological factors reflect interactions between working environment, job itself, working conditions, and those abilities, needs, and culture which a worker has, as well as his or her personal relations outside a job which can influence his or her health, work efficiency, and job satisfaction.

Harassment as behavior which violates personal privacy of a worker is rather new for our country; it has been taken from the Anglo-Saxon countries legislation. Such behavior can include jokes, hints, obtrusive molesting, threats, etc. The US legislative system has certain peculiarities due to which a company and not a supervisor (worker) who committed illegal actions acts as a defendant in court cases related to complaints about harassment. Companies usually wish to avoid publicity and reputation losses so they prefer to pay compensations to a victim rather than lose their clients' respect. According to several authors, a concept of harassment and its difference from just simple courtship is determined by social and psychological perceptions which differ from country to country [3].

Questioning results revealed quite rare cases (3-5%) of harassment, and their quantity was equal both for female migrants and local people in Moscow region. About 77% women never faced harassment.

Questioning results were used to assess frequency of psycho-social factors which caused job stress. Prevalence of job stress factors at jobs with high neuro-emotional loads turned out to be quite apparent. Long irregular working hours

were a typical feature of working life mentioned by workers from all occupational groups; it led to low job satisfaction.

Such job demands as fast working tempo, and absence of freedom (constant control over job techniques and quality, its rate, an order of actions in which a task was performed) were widely spread among social workers and amounted to  $36.67 \pm 7.97$  % cases (class 3.2). Poor career development prospects were detected for female migrants working as nurses and child-minders.

When being questioned, workers from all occupational groups whose labor involved high neuro-emotional loads mentioned the necessity to focus their attention, to percept information quickly and precisely, to remember a great volume of information by ear and visually, to perform several activities simultaneously. Working under disturbances (35.0% positive answers) turned out to be most typical for females working as child-minders. Questioning results revealed a big share of people complaining on job stress. Stress situations occurred weekly, 38.9% of social sphere workers mentioned they had them several times a week. Unfavorable interpersonal relations in a team should be mentioned among factors determining low job satisfaction.

Physiological research performed on female labor migrants included examining neuro-muscular system functional state as it was occupationally vital in providing job reliability of all the studied occupational groups. Examination of neuro-muscular system functional state in working day dynamics revealed that maximum strength of a right working arm tended to decrease by the end of a working shift in comparison with its beginning. Endurance to a statistic effort authentically decreased by the end of a working day in comparison with the value before it started. We detected 29.3 % decrease in housemaids and nurses, and 28.2 % in child-minders ( $p \leq 0.05$ ). Statistically significant decrease in maximum muscular capacity was detected even after 4 hours of work, and by the end of a working day this decrease amounted to

34.0; 28.9; 31.0 % of the value at its beginning correspondingly.

The expressed static strain in lumber region muscles caused by performing job tasks in an uncomfortable position (which was with  $45^\circ$  bending angle) by females employed in social sphere became apparent also in negative dynamics of backbone dynamometry parameters. Migrants working as housemaids had 49.7% decrease in maximum backbone muscles capacity from the initial value by the end of their working day; nurses, 35.3% decrease; child-minders, 32.7% ( $p \leq 0.05$ ).

The detected changes in dynamometry parameters in a shift dynamics and physiological changes value prove that strain and overstrain evolve in neuro-muscular system of female migrants' arms and backbone muscles. The first strain signs occur already after 4 hours of work. By the end of a working day neuro-muscular system strain is greatly evident.

The performed research results allowed us to detect a dependence between labor hardness and intensity and features of blood pressure changes and heart rate changes. Functional changes index assessment and its average values over a shift proved that great functional changes values were detected among female migrants under explicit labor loads. Thus, average functional changes index values over a shift amounted to  $3.12 \pm 0.07$  points in nurses and to  $3.20 \pm 0.05$  points in child-minders. Practically the same values were observed in housemaids. Decrease in functional abilities of the circulatory system and unsatisfactory adaptation in female migrants were detected in stressful working hours and by the end of a working shift.

The results of heart rate variability research revealed sufficient adaptation processes strain in female migrants as per regulatory systems activity parameter (PARS). Thus, female migrants employed in social sphere had this parameter varying within  $4.74 \pm 0.54 - 5.85 \pm 0.64$  arbitrary units. It proved apparent strain in regulatory systems caused by active mobilization of protection mechanisms including increase in sympathoadrenal section activity.

Results of studying peculiarities of female migrants adaptation to living environment re-

vealed that all the examined women were at various adaptation stages. These peculiarities depended on how long women lived on the examined territories. If they stayed on an ecologically adverse territory for less than 3 years, the greatest specific weight of female migrants with unsatisfactory adaptation was detected

among Russians (36.04%); and body adaptation capabilities decreased drastically among Tadjiks, which led to 62.08% growth in number of people with adaptation mechanisms strain. Armenian females were better adapted to living conditions on the examined territories (table).

Table

Number of women (%) with various body adaptation capabilities in case they stayed for 0 to 3 years in Moscow regions

Migrants group	Adaptation level		
	Satisfactory adaptation	Adaptation mechanisms strain	Unsatisfactory adaptation
	(1)	(2)	(3)
Russians	23,95 ± 3,42	40,01 ± 1,38*	36,04 ± 2,05*
Armenians	26,83 ± 2,58	41,45 ± 1,88 *	31,72 ± 3,0
Tadjiks	14,70 ± 1,69	62,08 ± 1,38**	23,22 ± 3,11*

Note : \* $p \leq 0.05$ ; \*\* $p \leq 0.001$  – statistically authentic changes in comparison with (1).

When we examined women who stayed on the examined territory for longer than 3 years we revealed the common trend of increase in number of people with satisfactory adaptation to living environment. A number of people with adaptation mechanisms strain among Tadjiks females decreased two times in comparison with women who stayed on the examined territory for less than 3 years. But still unsatisfactory adaptation among female Tadjiks increased by 12.4% in comparison with women who stayed on the examined territory for less than 3 years and it indicated that body functional reserves were mobilized which could eventually lead to adaptation failure.

Research on  $\beta$ -adrenoreactivity of erythrocytes membranes in female migrants was performed depending on adaptation process stage as per functional changes index. When adaptation was satisfactory parameters of  $\beta$ -ARM were within physiological changes range and didn't depend on duration of staying; when there was adaptation mechanisms strain or adaptation was unsatisfactory, the most signifi-

cant increase in  $\beta$ -ARM parameter was observed in Tadjiks females regardless of duration of their staying on an adverse territory (figure).

When sympathoadrenal system becomes more active, protective cellular membranes desensitization occurs which leads to greater  $\beta$ -ARM parameters in blood. Increase in  $\beta$ -ARM value in all the examined women proved that their adrenoreactivity decreased at cellular and system levels which was the evidence of non-specific protection mechanisms aimed at eliminating destructive impacts exerted by increased catecholamine content under long-term psychoemotional stress. It proved changes in the processes of catecholamines synthesis, storage, and metabolism, as well as sensitivity (desensitization) of erythrocytes cellular membranes receptors. Such changes can be viewed as unfavorable predictive criterion of diseases risk with pathogenesis mostly related to sympathoadrenal system activity.

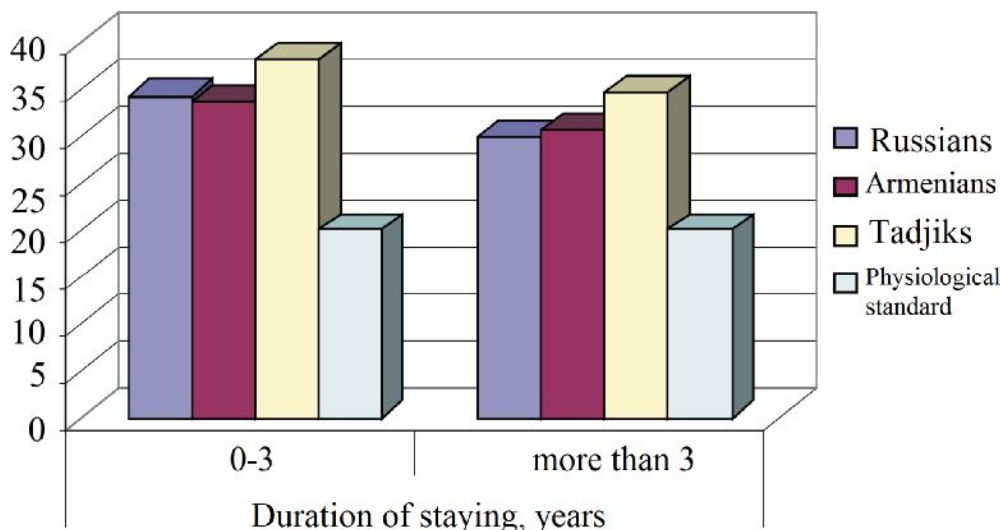


Figure. Parameters of  $\beta$ -ARM in blood of women from various occupational groups with unsatisfactory adaptation

The obtained data correlate directly to changes in physiological parameters of adaptation processes strain in the examined women. When adaptation protection mechanisms are mobilized under intense impacts exerted by environment as well as under psychoemotional pressure related to a move to a new place of residence and peculiarities of a body functioning in this new place, protective and modulating functions of desensitization can prevail and become apparent through more explicit strain in physiological parameters on the system level. It will undoubtedly lead to decompensated hyperadrenergic states and high risks of cardiovascular pathology and other diseases.

Health disorders prevention aimed at preserving migrants labor potential requires developing medical and social support activities allowing for functional rearrangement of a body regulatory mechanisms. Primary prevention includes physical training, health-improving activities, autogenic training, elimination of adverse social and occupational risk factors; secondary prevention comprises preliminary and periodical medical examinations.

**Conclusions.** The results of examining peculiarities of female migrants' functional state during adaptation to impacts exerted by neuro-emotional, social and psychological factors, physical (muscular) loads varying in

their intensity and duration revealed that adaptation strain syndrome as per physiological parameters became apparent through increase in index of functional changes in circulatory system, changes in heart rate variability as per regulatory systems activity parameter, PARS.

We determined peculiarities of adaptation process in female migrants: if they stayed on the examined territory for less than 3 years, the greatest specific weight of migrants with unsatisfactory adaptation was detected among Russians (36.04 %); and with adaptation mechanisms strain, among Tadjiks (62.08 %). But if they stayed for longer than 3 years, unsatisfactory adaptation parameters grew by 12.4% among Tadjiks which indicated that body functional reserves were mobilized and it could lead to adaptation failure.

Parameters of  $\beta$ -adrenoreactivity of erythrocytes membranes which were detected at satisfactory adaptation were within physiological changes range regardless of duration of staying. When adaptation mechanisms were strained or adaptation was unsatisfactory, the most significant increase in  $\beta$ -ARM parameter was observed in Tadjiks females regardless of how long they stayed on an ecologically adverse territory.

To preserve migrants health and labor potential, it is essential to organize medical and

social support for coming workers. primary health disorders prevention should include physical training, health-improving activities, autogenic training, elimination of adverse social and occupational risk factors. Secondary prevention techniques are systematic medical control over migrants' health including preliminary and periodical medical examinations.

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