ADAPTATION TO PHYSICAL ACTIVITIES BY INTERNATIONAL STUDENTS AT A RUSSIAN UNIVERSITY

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ABSTRACT

The problem of adaptation by international students to studying at a Russian university was addressed. The conditions under which the physical education and physical activity classes at the University exert influence on adaptation of first-year international students were examined. The dynamics of the adaptation potential of first-year international students experiencing different types of motor activity while studying at a Russian university was investigated. The initial psycho-emotional state, physical and functional fitness of the international students before Semester 1 were measured and compared to those of first-year Russian students. It was concluded that initial adaptation reserves of the first-year international students were lower than those of the first-year Russian students. The international students were divided into four groups based on the level of their physical activity. It was found that the international students attending only mandatory physical education classes could adapt to a new cultural environment within one academic year, whereas the international students attending additional non-mandatory classes or sports clubs could accelerate their adaptation by half.

Keywords: Physical Education; Sport; International students; Adaptation.

INTRODUCTION

The world is facing tremendous changes related to global population mobility, including mobility of labour migrants and individuals going abroad to pursue a prestigious college degree to become more competitive in the global labour market. As a rule, newcomers encounter significant barriers in their new countries detrimental to their socialisation, as well as to physical and psychological adaptation (Yua & Wright, 2016).

In recent years, the Russian government has been applying all possible efforts to create an attractive and unhostile environment for international students to pursue their college degrees at Russian federal universities for earning additional sources of money, as well as prestige. In July of 2013, a contest for receiving subsidies from the Russian government on implementing a plan of action aimed at increasing competitiveness of the leading Russian federal universities

versus universities located elsewhere in the world, was won by several Russian universities. The subsidised universities are to implement measures for luring international students to come to Russian universities from the leading foreign universities. Adaptation of international students to the Russian environment is becoming very important in this regard (Vadutova *et al.*, 2010; Grebennikova, 2011; Podzolkov, 2012; Shevchenko & Soboleva, 2012; Shevelev *et al.*, 2012; Anikina, 2014). International students arrive in Russia from both Commonwealth of Independent State (CIS) countries (former Soviet Union republics) and non-CIS countries. Among non-CIS countries are Asian countries, mostly China (Podzolkov, 2012), as well as African countries (Anikina, 2014). A much smaller group of non-CIS students arrive to Russia from Europe, South America or Central America.

In the open peer-reviewed literature, the problem of adaptation of international students to studying at Russian universities is still under-represented. It is generally agreed that international students at Russian universities encounter adaptation problems of the three types: academic problems (educational process related problems), individual problems (personality characteristics related problems) and sociocultural problems (new social environment related problems) (Kudryashov, 2012). Adaptation to the complex stress factor related to the necessity of accommodation in a new social, socio-psychological and climatic environment, supplemented by language barriers and a need to adapt to studying at a university itself (requiring changes in habits compared to habits adopted during high school years) is another important issue (Furnham & Bochner, 1986). Hence, several kinds of adaptation emerging simultaneously at the initial stage of studying at Russian universities come as great obstacles for both cognitive and communicatory activities of international students. Determination of factors promoting efficiency increase and adaptation process acceleration represents an integral part of the solution to the adaptation problem.

There still is an additional reserve for adaptation process acceleration, which lies in the field of physical activity (Fazleeva *et al.*, 2016). Physical activity is a powerful tool of recovery from mental and physical health problems, which, as is already known today, is helpful in coping with problems of adaptation to new living conditions and educational activities (Allen *et al.*, 2010; Grutsyak & Grutsyak, 2010; Vasenkov & Fazleeva, 2013; Noraseela *et al.*, 2016;). Physical activity indirectly influences adaptation performance via stress reduction, lowering anxiety and depression, and boosting self-esteem (Freitas *et al.*, 2014; Kim & McKenzie, 2014). Regular physical exercise also reduce a risk of the appearance and progression of various illnesses (ACSM, 2014).

Most studies in the literature on physical activity of international students are concerned with US universities. According to recent studies, only a small fraction of international students in the USA involves regular physical activities (Yan & Cardinal, 2013). The studies have shown that physical activity strongly depends on the student's country of origin. The least physically active groups of international students at a US university are from Asian or African countries. Caucasian students are the most physically active. Participation in physical activity also depends on gender. For example, Asian male students are much more physically active than Asian female students (Yoh *et al.*, 2008; Taymoori *et al.*, 2010).

The problem of involvement of international students in physical activities at Russian universities is not as essential as that in the US universities, as physical education classes are

mandatory for all undergraduate students in Russia. The physical education classes are held twice a week (every class lasts two academic hours) during the first, second and third years of studying at the university, totalling 400 academic hours.

The number of international students at the university investigated increases constantly. In the 2014/2015 academic year, the number was only 2,106. In the 2015/2016 academic year, the number of international students that arrived from 91 countries, increased by nearly 50% and reached 3,200. In the 2016/2017 academic year, the number has grown to over 4,000. International students at the investigated university predominantly study economics, fundamental medicine and biology, international relations and oriental studies, philology, geology and oil-gas sciences. Less popular fields of study are law, social and psychological education, psychology and pedagogics. Chemistry, physics and mathematics are in much smaller demand.

In this investigation, a qualitative assessment of the dynamics of adaptation potential of the selected international students was used at three temporal (control) points: (1) prior to beginning of studying; (2) at the end of Semester 1; (3) at the end of Semester 2. Positive influence of physical activity on adaptation to a new environment at the investigated university was investigated.

PURPOSE OF RESEARCH

The purpose of this investigation was to establish a connection between adaptation of first-year international students to studying at the university and their level of physical activity. The generated data and recommendations could become a valuable contribution to legislators and policy makers toward better planning of physical education classes at universities in Russia, as well as throughout the world.

METHODOLOGY

At the beginning of Semester 1, the anxiety level of students was measured using the Spielberger method (Spielberger *et al.*, 1983). The method allows determining conditions and factors, under which the anxiety state appears, as well as the degree of maladaptation in the case of occurrence of psycho-traumatic situations. The method is well-known and used throughout the world for measuring anxiety state for purpose of determining a need for psychological support.

The level of psychological adaptation of students was measured using the health, activity and mood (HAM) express-method. The method is based on using a questionnaire containing 30 pairs of bipolar scales, which are grouped into three categories (indicators): health, activity and mood. The examinee identifies the degree of manifestation of each of these three indicators. The mean mark of the scale is 4.0. A value of an indicator (health, activity or mood) exceeding 4.0 corresponds to a favourable state of a person and a value smaller than 4.0 corresponds to an unfavourable state. Normal state values lie in the range of 5.0–5.5. The negative pole's extreme value is equal to 1.0, whereas the positive pole's extreme value equals 7.0. It is noteworthy that, in analysing a functional state, not only the values of three separate

indicators must be taken into account, but ratios of the three values are also important. A detailed description of the questionnaire, as well as of the HAM method as a whole, is available in a textbook (Il'in, 2005).

The qualitative and quantitative assessment method (Solov'ev, 2005) for investigating adaptation ability and its dynamics was used in the present study. The concept of adaptation level was introduced, which is an indirect characteristic of adaptation ability. The following four terms apply here: "satisfactory adaptation", "tension of adaptation", "unsatisfactory adaptation" and "adaptation failure" (Solov'ev, 2005). The terms "satisfactory adaptation" and "unsatisfactory adaptation" speak for themselves. The term "tension of adaptation" was introduced by Solov'ev (2005) and can be interpreted as inadequate tension of functional systems of an individual in response to exogenous stimuli (stress, environmental factors, etc.). The term "adaptation failure", according to Solov'ev (2005), implies a sharp decrease of functional capabilities of an individual caused by a failure of mechanisms of compensation from destructive influence of exogenous stimuli (the individual is incapable of compensating for the stressing destructive action of the exogenous stimuli).

Adaptation level was determined through adaptation potential (AP), which, in turn, was calculated by applying the following expression (Solov'ev, 2005:4):

$$AP \text{ (in points)} = 0.011 \cdot (HBR) + 0.014 \cdot (SAP) + 0.008 \cdot (DAP) + 0.014 \cdot (\text{age in years}) + 0.009 \cdot (\text{body weight in kg}) - 0.009 \cdot (\text{body length in cm}) - 0.27,$$

where HBR is heartbeat rate (per minute), SAP is systolic arterial pressure (mm Hg) and DAP is diastolic arterial pressure (mm Hg). Normative values of adaptation potential were adopted from Solov'ev (2005): I. Satisfactory adaptation - not more than 2.10; II. Tension of adaptation - from 2.11 to 3.20; III. Unsatisfactory adaptation is from 3.21 to 4.30; IV. Adaptation failure - over 4.30.

At the beginning of Semester 1, initial levels of functional and physical condition of international students, which reflect the level of adaptation abilities of an individual, had to be estimated. Functional conditions were determined using standard tests: Ruffier's test, orthostatic and clinostatic tests.

Participants

Before Semester 1, 152 students were selected and were made up of 97 Russian students and 55 international students. Analysing the Russian students before Semester 1 was necessary for comparing their initial conditions versus the initial conditions of the international students by the HAM method. No further monitoring of the Russian students was conducted.

Hereafter, the selected 55 international students will be referred to as the Control Group. The countries of origin of the participating international students in the Control Group were as follows: China – 32.7%; Uzbekistan – 25.4%; Kyrgyzstan – 11%; Turkmenistan – 11%; Iran – 9.1%; Turkey – 5.4%; other – 5.4%. All students (Russian and international students) majored in non-science fields, such as liberal arts and humanities, and studied at three institutes (schools) of the investigated university, namely the Institute of Psychology, Institute of International Relations and the Institute of Philology and Cross-cultural Communication.

RESULTS AND DISCUSSION

Regardless of the major subject or country of origin, a person can exhibit a certain anxiety level both prior to starting their studies at the investigated university and during the educational process. At first, the anxiety level before Semester 1 was determined. In this case, the Spielberger method was used to measure the anxiety level of the 152 students, of which 97 students were Russian students and 55 students were international students (Control Group). The following results were obtained for the Control Group: 68% of the international students exhibited high anxiety levels; 24% moderate anxiety levels; and 8% low anxiety levels.

The level of psychological adaptation was measured using the HAM method. It was revealed that before Semester 1, the health level of the international students had been much lower (average point was 3.97) compared to that of the Russian students (average point was 5.80). The average point of the international students for criteria "mood" and "activity" was also low at 4.10 and 3.98, respectively. As a comparison, the average point of Russian students for the criteria "mood" and "activity" was 5.5 and 5.8, respectively.

In addition, functional conditions (Ruffier's test, clinostatic and orthostatic tests) and physical conditions (long jumps, push-ups, and shuttle runs) was measured. The results indicated that the levels of 76% of the international students were low. Such indicators, in total, the level of adaptation of this contingent of students was characterised as unsatisfactory.

The ability to adapt is one of the fundamental properties of an individual, which represents a repository of its functional reserves and acts as a power source needed for preserving continuous interaction of an individual to changing environmental conditions. For several motor modes, the influence of physical activities on the adaptation of international students to studying at the university were investigated.

The typical schedule of physical education classes at all Russian universities is as follows. Duration of a class is 1.5 hours (two academic hours). The first 5-minute interval is gathering and lining up, then the next 20–25 minutes are used for warming up followed by the main activity of the day lasting 50–55 minutes, and the last 5–10 minutes is devoted to relaxation. As a rule, warming up is performed simultaneously by a large group of students (100–300 persons), pursuing a college degree in the same or very similar major, via various combined developing and running exercises. Then, in the main activity, students regroup into predefined smaller groups 25–30 people. Each group goes to a separate room for participation in different sports (track and field, volleyball, basketball, aerobics, swimming, soccer and tennis). The type of sport is selected by every student individually prior to starting their studies at the university. In the relaxation section, the student returns to a relatively quiet state through using slow running, walking and relaxation exercises.

As stated earlier, testing was conducted at three temporal points: prior to beginning of studying, at the end of Semester 1 (the 4th month of studying) and at the end of Semester 2 (the 9th month of studying). The testing showed that prior to beginning of studying, the majority of the international students of the Control Group had a condition of either tension of adaptation (26 students) or unsatisfactory adaptation (17 students) (Table 1).

After the beginning of Semester 1, the students experienced different amounts of physical loading and were divided into the following four groups:

A.   Students involved in physical activities only during mandatory physical education classes.

B.   Students involved in physical activities during mandatory physical education classes as well as during attending various sports clubs or individual classes.

C.   Students involved in physical activities during mandatory physical education classes as well as during attending various sports clubs or individual classes including participation in various sports competitions.

D.   Students exempted from mandatory physical education classes for health reasons.

The Group D students were students who were exempt from physical education classes for health reasons. Hence, the students experienced no physical activity at all. During Semester 1, there were five students in Group D. The testing showed that none of the five students demonstrated satisfactory adaptation to studying at the university. Three students exhibited unsatisfactory adaptation and one exhibited adaptation failure. In Semester 2, the number of students exempt from physical education classes increased to six and only two of the six students adapted and one student continued exhibiting adaptation failure.

The Group A students constituted the largest group in the study (26 people at the beginning of Semester 1 and 23 people at the beginning of Semester 2). These students attended only mandatory physical education classes. At the end of Semester 1, 38% of the students (10 people) exhibited satisfactory adaptation and 58% (15 people) tension of adaptation. At the end of Semester 2, the numbers increased to 78% (18 people) and 22% (5 people), respectively. These results indicated that most students attending physical education classes could successfully adapt.

The Group B students were those who attended both mandatory and non-mandatory individual classes and various sports clubs, on average 1–2 hours per week. By the end of Semester 1, 53% and 47% of the students demonstrated satisfactory adaptation and tension of adaptation, respectively. By the end of Semester 2, the numbers changed to 87.5% and 12.5%, respectively.

The Group C students were students who, in addition to attending mandatory and non-mandatory physical education classes, also participated in sports competitions. At the end of Semester 1, 78% and 22% of the students demonstrated satisfactory adaptation and tension of adaptation, respectively. By the end of Semester 2, the numbers changed to 80% and 10%, respectively. One student, who had attended only mandatory physical education classes in Semester 1, began attending non-mandatory individual classes and participating in sports competitions during Semester 2 (the person moved from Group A to Group C), however, the adaptation potential value of the student did not change.

Based on analysis of the presented data, a conclusion could be drawn that involvement of international students in various active physical activities during both educational process and extracurricular time could be responsible for positive dynamics of the adaptation potential of international students and, therefore, led to improved adaptation.

Table 1. **DYNAMICS OF ADAPTATION POTENTIAL EXHIBITING DIFFERENT TYPES OF MOTOR ACTIVITIES**

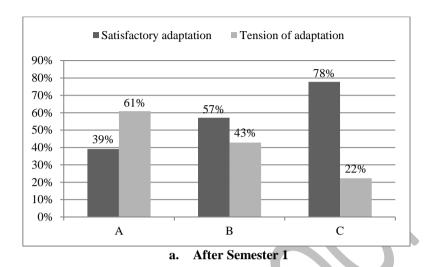| Semester	Motor act. (no. of students)	Adaptation potential value (no. of students)			
		I	II	III	IV
0 (prior to studying)	(55)	2.066 (6)	2.967 (26)	3.963 (17)	4.382 (6)
1 (end of Sem. 1)	A (26)	1.989 (10)	2.875 (15)	3.326 (1)	–
	B (15)	2.010 (8)	2.683 (7)	–	–
	C (9)	2.000 (7)	2.380 (2)	–	–
	D (5)	–	2.670 (1)	3.354 (3)	4.324 (1)
2 (end of Sem. 2)	A (23)	1.988 (18)	2.588 (5)	–	–
	B (16)	2.000 (14)	2.420 (2)	–	–
	C (10)	2.015 (8)	2.869 (1)	3.222 (1)	–
	D (6)	2.098 (2)	2.987 (2)	3.219 (1)	4.310 (1)

A= Physical activities only during mandatory physical education classes;
B= Physical activities during mandatory physical education classes as well as during attending various sports clubs or individual classes;
C= Physical activities during mandatory physical education classes as well as during attending various sports clubs or individual classes including participation in various sports competitions;
D= Exemption from mandatory physical education classes for health reasons.
I=Satisfactory adaptation (not more than 2.10)   II=Tension of adaptation (2.11–3.20)
III=Unsatisfactory adaptation (3.21–4.30);   IV=Adaptation failure (more than 4.30

Based on results presented in Table 1, six students (Group D students) out of the original 55 students were physically inactive and, therefore, were excluded at the next stage of the investigation. Thus, the HAM method was applied to the remaining 49 students from groups A, B and C. The investigation results for all three averaged characteristics showed a clear positive trend. After months 1, 4 and 9, the values for health were 3.97, 4.92 and 5.62; for activity were 4.10, 4.78 and 5.87; for mood were 3.98, 5.00 and 5.98, respectively.

During investigation, it was observed that some students changed their levels of motor activity within the year. For objective assessment of the influence of physical activities, these students were excluded from further consideration. In addition, the students having no physical activity were also removed. As a result, the investigated group was reduced to 47 international students demonstrating physical activity, at least, at a minimum amount (students from the A, B and C groups).

The results obtained at the end of Semester 1 indicated that there were no students exhibiting unsatisfactory adaptation. The percentage of students exhibiting tension of adaptation was 61% for Group A students and 22% for Group C students. At the same time, the percentage of students exhibiting satisfactory adaptation was 39% for Group A students and 78% for Group C students (Figure 1a). This indicated that there was a link between physical activity and adaptation. Increase in the amount of physical activity could improve adaptation.
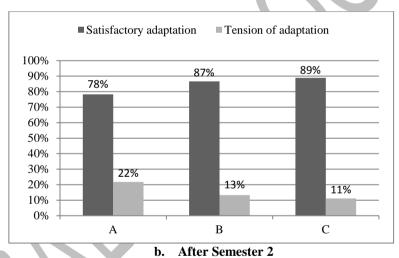
a. **After Semester 1**

b. **After Semester 2**

Figure 1. **PERCENTAGE OF STUDENTS FROM A, B AND C GROUPS WITH SATISFACTORY ADAPTATION AND TENSION OF ADAPTATION**

At the end of Semester 2, the fractions of international students from the A, B and C groups exhibiting satisfactory adaptation becoming nearly identical (Figure 1b). Satisfactory adaptation was exhibited by 78% of the Group A students, 87% of the Group B students and 89% of the Group C students, and tension of adaptation was exhibited by 22% of the Group A students, 13% of the Group B students and 11% of the Group C students. This was an additional proof that increase in physical activity could lead to the adaptation process acceleration.

The above important statements were confirmed by the observation that more than 78% of Group C students already became adapted by the end of Semester 1, whereas the percentage of

adapted Group C students by the end of Semester 1 only slightly exceeded 39%. Another important observation was that as the physical activity period got longer (one academic year), distinctions between the groups having various physical activity levels became less discernible.

CONCLUSION

The study showed that physical activity could serve as an additional reserve for the process of adaptation of international students to studying at Russian universities. The initial psycho-emotional state, physical and functional fitness of first-year international students at the investigated university was found to be lower than those of first-year Russian students that suggests a lower initial level of reactivity of an international student to physical loads and, as a result, a lower level of adaptation reserves.

Regular physical education classes with the optimum mode of the motor activity improve the psycho-emotional and functional state of international students and form an adequate response to multidimensional influences from the environment. Therefore, physical exercises lead to the acceleration of the adaptation processes. The study revealed that most of the university's international students from the investigated Control Group, who attended mandatory physical education classes, could get adapted within one academic year. Attending additional non-mandatory classes or sports clubs can lead to acceleration of the adaptation process by half.

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