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# INCREASING THE EFFICIENCY OF AEROBICS LESSONS FOR UNIVERSITY STUDENTS – WOULD-BE TEACHERS OF PHYSICAL TRAINING: GENDER ASPECT

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**Keywords:aerobics, basic aerobic steps, cardio load, differentiated approach, general cultural competencies, higher education.**

## ABSTRACT

The article considers the possibility to us objective criteria at aerobics lessons with university students, which could increase the students' competences in the sphere of health preservation and improvement. Cardio load was studied under various conditions of performing basic aerobic steps by male and female students. It was shown that it is possible to arrange health-improving, maintaining, developing and training regimes of physical load depending on the students' level of physical development and training. The presented experimental data indicate different adaptation mechanisms in students depending on gender, which testifies to the necessity of differential approach when planning lessons with basic aerobic exercises for males and females. The authors come to the conclusionthat by using aerobic exercises it is possible to form the competence aimed at maintainingappropriate physical conditions, which is necessary for efficient fulfillment of educational and professional activity.

**Key words:**aerobics, basic aerobic steps, cardio load, differentiated approach, general cultural competencies, higher education.

## INTRODUCTION

One of the contemporary trends is to change the content of education (Barannikov, Vachkova, Demidova, Remorenko, & Reshetnikova, 2016, p. 70;Mikhailova, Mikhailov, & Derevleva, 2015, p. 91). One of the directions of such changes is due to introduction of digital education, relying on the development of informational and communicative technologies(Khhlodov & Kuznetsov, 2007, p.7; Mikhailov, 2012, p. 156; Sych, 2009, p. 18, p. 107; Sych & Mikhailov, 2018, p.465). However,

introduction of informational technologies leads to decrease of the overall amount of motor activity of students and negatively influences their health(Ermakov, Ivashchenko, & Guzov, 2012, p. 59; Shtikh, & Tkhorev, 2008, p. 46; Stepanchenko, 2013, p.63; Vereshchagina, Gafiatulina, Kumykov, Stepanov, & Samygin, 2015,p. 223).

The standards of higher professional education include competences related to health preservation. Usually, they are stipulated within the content of general cultural competences. One of such competences is formulated as "ability to maintain the due level of physical training to facilitate full-fledged social and professional functioning, propagate active longevity, healthy life style and prevent diseases" in the federal state standards of professional education in majors43.03.01 "Service" and 43.03.02 "Tourism" (Federalnyy gosudarstvennyy obrazovatelnyy standart vysshego obrazovaniya po napravleniyu 43.03.01…; Federalnyy gosudarstvennyy obrazovatelnyy standart vysshego obrazovaniya po napravleniyu 43.03.02…). In the educational standards of other majors (04.03.01 "Chemistry", 09.03.03 "Applied Computer Science", 37.03.01 "Psychology", 37.03.02 "Conflictology", 38.03.01 "Economics", 38.03.02 "Management", 38.03.03 "Personnel Management", 38.03.04 "State and Municipal Management", 38.03.05 "Business Computer Science", 39.03.01 "Sociology", 39.03.02 "Social Work", 40.03.01 "Law", 41.03.02 "Russian Regional Studies", and 41.03.03 "Oriental Studies") this general cultural competence (GC-8) is formulated as "ability to use methods and means of physical culture to facilitate full-fledged social and professional functioning" (Portal…); in the educational standards of majors 44.03.01 "Pedagogical Education", 44.03.04 "Professional Education" it is formulated as "readiness to maintain the level of physical training facilitating full-fledged functioning" (Federalnyy gosudarstvennyy obrazovatelnyy standart vysshego obrazovaniya po napravleniyu 43.03.04…).

When studying in the professional education institutions, formation of these competences requires using pedagogical ideas which clarify the significance of physical exercises for children and youth (Papageorgaki, 2018; Campbell, Gray, Kelly, & MacIsaac, 2018), consider the gender differences when arranging physical training (Campbell et al., 2018). Researchers are constantly searching for new techniques of using various types of motor activity (Korol'kov, 2013, p. 15; Mikhailov, 2012, p.96; Orlov, 2009, p. 83). At the same time, as it is marked in literature, one of the most appealing types of motor activity is health-improving aerobics (Kryuchek, 2001, p. 9; Lisitskaya & Novikova, 2014, p.7; Shtikh & Tkhorev, 2008, p. 63; Shtyrova, 2016, p.46).The present research attempts to search for objective indicators for planning load during physical training of students involving health-improving aerobics, which could serve as objective indicators for creating informational programs for university students' training, to facilitate formation of their general cultural competences.

Aerobics as a type of motor activity was not chosen by chance. It has a number of advantages. A wide range of movements used in aerobics allow developing the key physical qualities in young specialists: strength, velocity, flexibility, coordination, and endurance; this creates prerequisites for forming the high level of working capacity for educational and professional activity (Derevleva & Mikhailova, 2007, p. 48; Mikhailova & Mikhailov, 2015, p.14), and allows reducing body weight in young

females(Runenko, Razina, Shelekhova, & Mushkabarov, 2018). A lot of researches of aerobics mark its large possibilities in preserving and improving students' health.

A number of researches present informational-educational systems intended for arranging aerobics training(Belyaeva, 2007). These techniques make it possible to arrange aerobics training based on the general set of aerobic exercises and the level of physical training of the students. However, at an aerobics lesson, a teacher has to rely on objective criteria characterizing the students' conditions (Mikhailova & Mikhailov, 2015, p.13)and related to the conditions of performing motions at the lessons.

Materials andMethods

The objective of the present research was to increase the efficiency of aerobics lessons for improving health of students, would-be teachers of physical training, studying at professional educational institution "Moscow City University" (further – University).

The experimental part of our research involved students of the Pedagogical Institute of Physical Culture of the Moscow City University. The students performed basic aerobic steps"run", "swing" and "jump" during the stages of a physical training lesson, described below. Such choice of aerobic exercises was due to the fact that these exercises significantly differ from each other in performance technique and are associated with a certain degree of performance of the key functional systems of a performer. The selected objective indicator was heart rate, which characterizes cardio load during a physical training lesson(Derevleva&Mikhailova, 2007, p. 49).

Measurements were performed during lessons of physical training with 4-year students of the above University, would-be teachers of physical training. The value of cardio load was measured at six stages of the lesson:

Measurement 1. Initial, performed immediately after the reparatory part of a physical training lesson.

Measurement 2. A fragment of the main part of a physical training lesson, including learning the technique of performing the selected aerobic step.

Measurement 3. A fragment of the main part of a physical training lesson, aimed at consolidating the mastered exercise with the selected aerobic step.

Measurement 4. A fragment of the main part of a physical training lesson, including the performance of the selected aerobic step with the maximal intensity and maximal amplitude of movements.

Measurement 5. A fragment of the main part of a physical training lesson, including demonstration (presentation) of the selected basic aerobic step by students.

Measurement 6. Concluding, performed in the final part of a physical training lesson.

Each measurement was performed during two and a half minutes with devices manufactured by Polar company.Further we denote heart rate indicators as cardio load. Such terminology is due to the fact that heart rate reflects the functioning of heart and changes depending on the load performed.

The research included 25 male and 17 female 4-year students of Pedagogical Institute of Physical Culture of the above University. Their physical indicators are shown in Table 1.

Table 1. Physical development indicators of 4-year students

| Participants | Age, years | Height, cm | Weight, kg |
|---|---|---|---|
| Males (n=25) | 19.3±0.7 | 178.7±9.3 | 74.4±10.7 |

| | | | |
|---|---|---|---|
| Females(n=17) | 20±1.7 | 167.8±6.4 | 58.5±5.9 |

**RESULTS**

The results of cardio load measurement under six various conditions of performing the basic aerobic steps "run", "jump" and "swing"are shown in Table 2.

Table 2. Dynamics of cardio load indicators during performance of the basic aerobic steps by students

| Basic aerobic exercise | | Conditions of performing the aerobic exercise | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Run | m | 89.8±7.2 | 122±16.1 | 142.6±14.7 | 147.4±26.7 | 94.8±5.7 | 91±6.4 |
| | f | * 91.4±15.2 | 126.7±18.2 | 146.8±17.1 | 159.2±19.5 | 120.0±22.1 | 94.6±10.9 |
| Jump | m | 98.3±11.6 | 134±16.0 | 153±19.0 | 154±22.0 | 135±24.0 | 96.3±15.2 |
| | f | 87.8±7.8 | 145.5±25.6 | 162.0±23.3 | 168.4±20.6 | 140.3±17.5 | 89.6±10.2 |
| Swing | m | 90±9.6 | 133.0±17.0 | 148.0±19.0 | 162.0±17.7 | 138.0±15.0 | 90.5±9.3 |
| | f | 89.6±14.5 | 146.0±17.1 | 155.0±13.8 | 168.0±22.9 | 135.0±19.6 | 90.4±12.2 |

In measurement 2, when aerobic exercise "run" was learned, cardio load in male students reliably increased (P<0.01), compared to the same indicators during measurement 1, immediately after warm-up, and reaches the average value of 122±16.1bpm (Table 3). In measurement 2, values of cardio load in the group changes from 90 to 150 bpm. The amount of cardio load growth in individual participants was different, fluctuating from 20to50 bpm. In measurement3, during performance of the mastered aerobic exercise "run", cardio load reached 142.6+14.7 bpmand were reliably higher than during measurement 2 (p<0.01, Table 3). In measurement 4, when the aerobic exercise "run" was performed with maximal intensity, cardio load reached 147.4+26.7 bpm and were reliably higher than during all other conditions of its performance (p<0.01, Table 3). In measurement5, during demonstration of the exercise, cardio load in males decreased to 94.8+5.7 bpmand were reliably lower than in other cases of performing the "run" exercise (p<0.01, Table 3).

Table 3. Estimation of reliability of differences in cardio load indicators when performing the basic aerobic exercise "run" by male students under conditions 1–6 of the pedagogical experiment

| Conditions | X± σ | Student's t-criterion and level of significance, P |
|---|---|---|

| of performing the aerobic exercise "run" | bpm | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1. | 89.8±7.2 | | | | | | |
| 2. | 122±16.1 | 9.13<br><0.01 | | | | | |
| 3. | 142.6±14.7 | 16.20<br><0.01 | 4.72<br><0.01 | | | | |
| 4. | 147.4±26.7 | 10.42<br><0.01 | 4.07<br><0.01 | 0.79<br>>0.05 | | | |
| 5. | 94.8±5.7 | 2.72<br><0.01 | 7.96<br><0.05 | 15.16<br><0.01 | 9.63<br><0.01 | | |
| 6. | 91.0±6.4 | 0.62<br>>0.05 | 8.94<br><0.01 | 16.09<br><0.01 | 10.27<br><0.01 | 2.21<br><0.05 | |

The trends in female students performing the "run" aerobic exercise are changed in the same direction as in male students, namely, cardio load reliably increases when the conditions of performance are changed from the second to the fifth measurement, and then decrease towards the end of the lesson, reaching 94.6+10.9 bpm (Table 4). As Table 2 shows, the values of cardio load in female students when performing the "run" aerobic exercise exceed the same values in male students, especially during measurements 4 and 5, when the aerobic exercise "run" is performed with maximal intensity and is accompanied by presentation of this exercise to a group of students. The features of this gender difference will be considered in "Discussion" section.

Table 4. Estimation of reliability of differences in cardio load indicators when performing the basic aerobic exercise "run" by female students under conditions 1–6 of the pedagogical experiment

| Conditions of performing the aerobic exercise "run" | X± σ bpm | Student's t-criterion and level of significance, P | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| 1. | 91.4±15.2 | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2. | 126.7±18.2 | 6.13<br><0.01 | | | | | |
| 3. | 146.8±17.1 | 9.97<br><0.01 | 3.32<br><0.01 | | | | |
| 4. | 159.2±19.5 | 11.31<br><0.01 | 5.02<br><0.01 | 1. 97<br>>0.05 | | | |
| 5. | 120.0±22.1 | 4.40<br><0.01 | 0.96<br>>0.05 | 3.95<br><0.01 | 5.48<br><0.01 | | |
| 6. | 94.6±10.9 | 0.71<br>>0.05 | 6.23<br><0.01 | 10.60<br><0.01 | 11.91<br><0.01 | 4.24<br><0.01 | |

Estimation of reliability of differences in cardio load indicators under various conditionswhen performing thebasic aerobic steps “run”, “jump” and “swing” a\is shown in Table 5.The changes of cardio load in male students under various conditions allow making certain conclusions on its correlations in young males:

- exercise “jump” is accompanied by reliably higher values of cardio load after warm-up, compared to exercises “run” (P<0.01) and “swing” (P<0.01), but does not exceed accidental error when comparing this indicator when performing aerobic exercises “run” and “swing” (Table 5, line 1);
- cardio load during measurement 2 is reliably higher in exercises “jump” and “swing” compared to exercise “run” (P<0.01); however, there are no reliable differences in cardio load during exercises “jump” and “swing” (Table 5, line 2);
- learning of exercise “jump” is accompanied by the highest cardio indicators, which are reliably higher than during “run” exercise (p<0.01), but are statistically unreliable during “swing” exercise (p>0.05) and between the “jump” and “swing” exercises (p>0.05,Table 5, line 3);
- in measurement 4,the highest cardio load was marked during “swing” exercise, which reliably exceeded the same indicator during “run” exercise (P<0.01), but does not reliably differ from the same indicator during “jump” exercise (Table 5, line 4);
- during presentation of aerobic exercises, cardio load during “run” exercise was reliably lower than during the “jump” and “swing”exercises (p<0.01), but they did not reliably differ between each other (p>0.05, Table 5, line 5);
- in the final part of the lesson, there were no reliable differences between values of cardio load in all three aerobic exercises, i.e. restoration up to a certain level takes place regardless of which aerobic exercise was performed (p>0.05, Table 5, line 6).

Table 5. Estimation of reliability of differences in cardio load indicators when performing the basic aerobic steps “run”, “jump” and “swing” by male students under conditions 1–6 of the pedagogical experiment

| Conditions of performing the aerobic exercises | X± σ bpm | X± σ bpm | X± σ bpm | Reliability of differences | | |
|---|---|---|---|---|---|---|
| | Run | Jump | Swing | P 1,2 | P2,3 | P1,3 |
| 1. | 89.8±7.2 | 98.3±11.6 | 90.0±9.6 | 3.11 <0.01 | 2.76 <0.01 | 0.08 >0.05 |
| 2. | 122±16.1 | 134.0±16.0 | 133.0±17.0 | 2.64 <0.01 | 0.21 >0.05 | 2.35 <0.01 |
| 3. | 142.6±14.7 | 153.0±19.0 | 148.0±19.0 | 2.29 <0.01 | 1.04 >0.05 | 1.00 >0.05 |
| 4. | 147.4±26.7 | 154.0±22.0 | 162.0±17.7 | 0.95 >0.05 | 1.41 >0.05 | 2.28 <0.01 |
| 5. | 94.8±5.7 | 135.0±24.0 | 138.0±15.0 | 8.14 <0.01 | 0.53 >0.05 | 13.46 <0.01 |
| 6. | 91.0±6.4 | 96.3±15.2 | 90.5±9.3 | 1.61 >0.05 | 1.63 >0.05 | 0.22 >0.05 |

The comparative analysis of reliability of differences in cardio load indicators in female students during the six measurements shows the following trends (Table 6):

- measurements 1, 4, and 6 were not accompanied by reliable changes in cardio load during performance of all three basic aerobic steps ($p>0.05$, Table 6, line 1);
- in measurement 2, cardio load is reliably higher during performing aerobic exercises “jump” and “swing” compared to the aerobic exercise “run” ($p<0.01$); however, no reliable differences were marked between “jump” and “swing”exercises ($p>0.05$, Table 6, line 2);
- learning of the “jump” aerobic exercise was accompanied by the highest values of cardio load, which are reliably higher than during the “run” aerobic exercise ($p<0.01$), but are comparable with cardio load values during the “swing” aerobic exercise ($p>0.05$, Table 6, line 3);
- during demonstration of aerobic exercises,cardio load during the “run” aerobic exercise was reliably lower than that during “jump” and “swing” exercises ($p<0.01$), but does not reliably differ between the latter two exercises ($p>0.05$, Table 6, line 5).

Table 6. Estimation of reliability of differences in cardio load indicators when performing the basic aerobic steps “run”, “jump” and “swing” by female students under conditions 1–6 of the pedagogical experiment

| Conditions of performing the aerobic exercises | X± σ bpm | X± σ bpm | X± σ bpm | P 1,2 | P 2,3 | P 1,3 |
|---|---|---|---|---|---|---|
| | Run | Jump | Swing | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | 91.4±15.2 | 87.8±7.8 | 89.6±14.5 | 0.87<br>>0.05 | 0.45<br>>0.05 | 0.35<br>>0.05 |
| 2. | 126.7±18.2 | 145.5±25.6 | 146.0±17.1 | 2.47<br><0.01 | 0.07<br>>0.05 | 3.18<br><0.01 |
| 3. | 146.8±17.1 | 162.0±23.3 | 155.0±13.8 | 2.17<br><0.01 | 1.07<br>>0.05 | 1.54<br>>0.05 |
| 4. | 159.2±19.5 | 168.4±20.6 | 168.0±22.9 | 1.34<br>>0.05 | 0.05<br>>0.05 | 1.21<br>>0.05 |
| 5. | 120.0±22.1 | 140.3±17.5 | 135.0±19.6 | 2.97<br><0.01 | 0.83<br>>0.05 | 2.09<br><0.01 |
| 6. | 94.6±10.9 | 89.6±10.2 | 90.4±12.2 | 1.38<br>>0.05 | 0.21<br>>0.05 | 1.06<br>>0.05 |

Learning of the "run" aerobic exercise was accompanied by the lowest values of cardio load, which amounts to 126.7+18.2 bpmagainst 145.5+25.6 bpmduring learning of the "jump" aerobic exercise ($p<0.01$) and 146.0+17.1 bpmduring learning of the "swing" aerobic exercise ($p<0.01$, Table 2).

The comparative estimation of average cardio load values in male and female students during basic aerobic exercises "run", "jump" and "swing" under the stated conditions of measurements 1–6 is shown inTable 7.It characterizes the gender differences in performing the aerobic exercises.

The reliable differences of average cardio load values between male and female students were found in the following cases:

- when performing the "run" exercise in measurement 5 (presentation of "run" aerobic exercise, $p<0.01$);
- when performing the "jump" exercise in measurement 1 (after preparatory part of a lesson, $p<0.01$),measurement 2 (learning the technique of the basic aerobic exercise "jump", $p<0.01$),and measurement 5 (intensive performance of the basic aerobic exercise "jump",$p<0.01$);
- when performing the exercise "swing"in measurement 2 (learning the technique of the basic aerobic exercise "swing", $p<0.01$).

Table 7. Estimation of reliability of differences in cardio load indicators when performing the basic aerobic steps "run", "jump" and "swing" by male (n=25) and female (n=17) students under conditions 1–6 of the pedagogical experiment

| Conditions of performing the aerobic exercises | X± σ bpm | X± σ bpm | Level of significance, P |
|---|---|---|---|
| "Run" | Males | Females | |

| Conditions of performing the aerobic exercises | X± σ bpm | X± σ bpm | Level of significance, P |
|---|---|---|---|
| "Run" | Males | Females | |
| 1. | 89.8±7.2 | 91.4±15.2 | 0.41 >0.05 |
| 2. | 122.0±16.1 | 126.7±18.2 | 0.86 >0.05 |
| 3. | 142.6±14.7 | 146.8±17.1 | 0.83 >0.05 |
| 4. | 147.4±26.7 | 159.2±19.5 | 1.65 >0.05 |
| 5. | 94.8±5.7 | 120.0±22.1 | 4.60 <0.01 |
| 6. | 91.0±6.4 | 94.6±10.9 | 1.22 >0.05 |
| "Jump" | | | |
| 1. | 98.3±11.6 | 87.8±7.8 | 3.51 <0.01 |
| 2. | 134.0±16.0 | 145.5±25.6 | 6.99 <0.01 |
| 3. | 153.0±19.0 | 162.0±23.3 | 1.32 >0.05 |
| 4. | 154.0±22.0 | 168.4±20.6 | 2.16 <0.01 |
| 5. | 135.0±24.0 | 140.3±17.5 | 0.83 >0.05 |
| 6. | 96.3±15.2 | 89.6±10.2 | 1.71 >0.05 |
| "Swing" | | | |
| 1. | 90.0±9.6 | 89.6±14.5 | 0.10 >0.05 |

| Conditions of performing the aerobic exercises | X± σ bpm | X± σ bpm | Level of significance, P |
|---|---|---|---|
| "Run" | Males | Females | |
| 2. | 133.0±17.0 | 146.0±17.1 | 2.42<br><0.01 |
| 3. | 148.0±19.0 | 155.0±13.8 | 1.38<br>>0.05 |
| 4. | 162.0±17.7 | 168.0±22.9 | 0.91<br>>0.05 |
| 5. | 138.0±15.0 | 135.0±19.6 | 0.53<br>>0.05 |
| 6. | 90.5±9.3 | 90.4±12.2 | 0.03<br>>0.05 |

In other cases, the hypothesis of reliable differences in cardio load in male and female students was not confirmed (Table 7).

Analysis of cardio load under various conditions modeled during the pedagogical experiment shows that the value of cardio load is slightly higher in females than in males, when performing the basic aerobic steps in all situations when measurements were carried out (Table 7).

**DISCUSSION**

The basic aerobic steps "run", "jump" and "swing"performed under the conditions of a pedagogical experimentallow changing the cardio load in a wide range: from 90 to 190 bpm, both in male and female students. Taking into account that load may differ in a wide range in a physical training lesson, the following preliminary conclusions can be made after the pedagogical experiment.

The basic aerobic steps allow matching the load in such a way that the health-improving tasks will be changed. Thus, performing the "run" aerobic exercise in measurements1, 2, 5,and 6 will change the cardio load in a range from 90 to 120 bpm in both male and female students; the above measurements correspond to the conditions of students at various stages of a lesson: after warm-up, when learning an exercise, when presenting it, and at the final stage of a lesson. The above range corresponds to health-improving regime of this aerobic exercise (Khhlodov&Kuznetsov, 2007, p.272). However, performing the same exercise under conditions 3 and 4changes the physical load regime into developing one, when cardio load ranges from 140to 160 bpm in both male and female students (Table 7).

Aerobic exercises create the health-improving regime only at the preparatory and final stages of a lesson (conditions 1 and 6). During measurements 2 and 5,the same aerobic exercisescreate cardio load in a range from 130 to 140 bpm, which refers the physical load regime to the maintaining one, when physical properties remain unchanged. During measurements 3 and 4,aerobic exercises "jump" and "swing"

create cardio load in a range from 140 to 160 bpm, which refers the physical load regime to the developing one, and in some participants – to the training one.

By estimating the cardio load for different variants of the exercise intensity, when the exercise is first learnt (measurement 2), then mastered (measurement 3) and then performed with full intensity (measurement 4),we may correlate the stages of performing the aerobic exercise with the physical load regime. Thus, the stage of initial learning of "run" aerobic exercise is correlated with the health-improving physical load regime, and of "jump" and "swing" aerobic exercise – with the maintaining physical load regime. The stage of mastering of all three aerobic exercises is usually correlated with the maintaining physical load regime, while the stage of improving the technique of an aerobic exercise –with the developing, and sometimes – with the training physical load regime (Table 7). The factual confirmation of such interrelations makes it possible to correctly plan the content of lessons, relying on the objective indicators of heart rate of every individual student.

Also, it should be noted that the analysis of gender differences in body reactions when performing the basic aerobic steps makes it possible to consider gender differences when planning aerobics exercises at physical training lessons. It was found that aerobic exercises cause smaller growth of cardio load in male than in female students. This fact can probably be explained by higher indicators of physical training in male students compared to females ones.

When planning aerobics exercises, it should be taken into account that presentation, i.e. demonstration of aerobic exercises causes more significant growth of cardio load in female students compared with male ones (see Tables 2 and 7). This is probably due to the higher emotional reaction of girls to the performed aerobic exercises, which should be taken into account at aerobics lessons. At that, while the physical load during measurement 4 is of developing character in male students, in female students it is apparently of training character. Desire to achieve essential changes in body-build, to acquire certain level of efficiency, to become more beautiful through exercises – this is an incomplete list of motives of the female students(Zhuravleva, 2012; Zhuravskaya&Asmolov, 2011). In male students, these motives are weaker, while they have other motives like acquiring such male features as strength, will, masculinity (Ermakov et al., p.60).

The fact that performing the same aerobic exercises by male and female students causes different responses reflected in different values of cardio load should be taken into account when arranging the aerobics lessons.In particular, it can be reflected in a more appropriate sequence of aerobic exercises. In this case, the main part of the aerobics lesson should include less intensive exercises, like "step", "run", or their modifications, and only later – such aerobic exercises as "jump", "swing", etc. Taking into account the need for the cardiovascular system of the students to adapt to physical load, the intensity of aerobic exercises should be regulated. The exercise intensity can be increased by adding motions of different parts of body. For example, inclusion of motions of arms, turns or bending of body can change the physical load regime from the maintaining to developing one.Also, music with a different rhythm may increase load at aerobics lessons (Kryuchek, 2001; Lisitskaya&Novikova, 2014).

Changes in cardio load of male and female students testify to the different adaptation mechanisms depending on gender, which leads to the necessity to use differential approach when planning aerobics lessons for male and female students. The load in groups with predominant number of girls should include fewer exercises, and the number of their repetitions should also be reduced compared with male groups.

Analysis of experimental data on changes of cardio load in students shows that it is possible to maintain physical conditions by aerobics lessons, thus using the physical training lessons to form the competence of preserving and improving health in would-be specialists.

## CONCLUSIONS

The regularities of changing the cardio load when performing the basic aerobic steps at the selected stages of a lesson show that the following should be taken into account when planning a physical training lesson with university students:

1. when performing the basic aerobic steps, the cardio load increases during transition from learning an exercise to its performance with maximal intensity;

2. when demonstrating the selected basic aerobic steps, the students' cardio load reliably does not differ from the same indicator when learning the steps; an exception is cardio load of male students performing the "run" exercise ($P<0.01$);

3. the cardio load in the beginning and in the end of a lesson reliably does not differ ($P>0.05$);

4. when presenting the basic aerobic steps, the amount of cardio load reliably decreases compared to the stage of performing them at slow and maximal rates ($P<0.01$).

The obtained regularities can be used for digitalization of the technique of physical training of university students.

Lessons with aerobic exercises form the ability to maintain the proper level of physical training in students, necessary for their full-fledged participation in educational and professional activity.

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