

THE INFLUENCE OF NON-PHARMACOLOGICAL AIDS ON TRAINING ACTIVITIES OF STUDENTS OF HIGHER EDUCATIONAL INSTITUTIONS

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Abstract

The actuality of the study is determined by the introduction of non-pharmacological aids, that include aroma oils and their compositions, into the training process of students in sports mastery groups, to enhance the body's functional reserves and the effectiveness of training activities. *The purpose* of the study is to detect the effects of aroma compositions (compositions of vegetable essential oils) on the functional, psycho-emotional state and physical capacity of students of higher educational institutions in terms of training activities. *Research results.* The results of the study indicate that the experimental group has a tendency to improve the psycho-emotional state, that is evident from the results of the SUN test, which indicates that the activity increased from $3,6 \pm 0,5$ points to $4,2 \pm 0,6$ points. The mood increased by 14 %, the desire to work compared with the background indicators increased from $3,6 \pm 0,5$ point to $4,2 \pm 0,6$ points. The feeling has improved by 9 %. With the accumulation of aroma compositions, a decrease in heart rate at rest is observed at $72,9 \pm 1,59$ ($75,9 \pm 1,56$ at the beginning). The pulse pressure index at the beginning of the study was $45,6 \pm 0,87$ points, after – $44,18 \pm 0,96$ points. The Robinson index after the application of aroma sessions was $84,7 \pm 2,06$ points, the Ruffle index – $6,50 \pm 1,1$ points, the EGC changed from $7,11 \pm 0,27$ cm to $8,35 \pm 0,23$ cm. The results of technical actions grew from 5 % to 44,1 % on average, indicators of gaming actions in the innings grew from 37,54 % to 41,62 %; gaming activities in the defense grew from 43,16 % to 46,20 %; gaming attacks in the attack from 46,13 % to 50,08 %; gaming activities in the reception rose from 42,38 % to 48,47 %. Thus, all indicators of action games increased from 9 % to 19 % after the pedagogical experiment.

Key words: students, aroma oils, teraceti, training activity, functional state.

Роман Черкашин, Олександр Валькевич, Микола Білера, Вікторія Матійчук. Вплив нефармакологічних засобів на тренувальну діяльність студентів вищих навчальних закладів. Актуальність дослідження зумовлена впровадженням у навчально–тренувальний процес студентів, котрі займаються в групах підвищення спортивної майстерності, нефармакологічних засобів, до яких належать аромамасла та їх композиції, для підвищення функціональних резервів організму й ефективності тренувальної діяльності. *Мета дослідження* – виявлення ефектів спрямованого впливу аромакомпозицій (композицій рослинних ефірних масел) на функціональний, психоемоційний стан і фізичну працездатність студенток вищих навчальних закладів в умовах тренувальної діяльності. *Результати дослідження.* Результати дослідження свідчать, що в досліджуваній групі спостерігається тенденція до поліпшення психоемоційного стану, що видно з результатів тесту САН, який свідчить що активність підвищилась із $3,6 \pm 0,5$ бала до $4,2 \pm 0,6$ бала. На 14 % підвищився настрій, бажання працювати, порівняно з фоновими показниками, зросли з $3,6 \pm 0,5$ до $4,2 \pm 0,6$ бала. Самопочуття покращилося на 9 %. При накопиченні аромакомпозицій спостерігається зниження ЧСС у спокої $72,9 \pm 1,59$ ($75,9 \pm 1,56$ на початку). Показник пульсового тиску на початку дослідження становив $45,6 \pm 0,87$ од., після – $44,18 \pm 0,96$ од. Індекс Робінсона після застосування аромасансів становив $84,7 \pm 2,06$ од., Індекс Руф'є – $6,50 \pm 1,1$ бала, ЕГК змінилась з $7,11 \pm 0,27$ см до $8,35 \pm 0,23$ см. Результати технічних дій зросли в середньому від 5 % до 44,1 %, показники ефективності ігрових дій при подачі підвищилися із 37,54 до 41,62 %; ігрових дій при захисті зросли з 43,16 до 46,20 %; ігрових дій у нападі з 46,13 % до 50,08 %; ігрових дій у прийомі зросли з 42,38 до 48,47 %. Тобто всі показники ігрових дій збільшилися від 9 до 19 % після педагогічного експерименту.

Ключові слова: студенти, аромамасла, терасети, тренувальна діяльність, функціональний стан.

Роман Черкашин, Александр Валькевич, Николай Билера, Виктория Матийчук. Влияние нефармакологических средств на тренировочную деятельность студентов высших учебных заведений. Актуальность исследования обусловлена внедрением в учебно–тренировочный процесс студентов, занимающихся в группах повышения спортивного мастерства, нефармакологических средств, к которым относятся аромамасла и их композиции, для повышения функциональных резервов организма и эффективности тренировочной деятельности. *Цель исследования* – выявление эффектов направленного воздействия аромакомпозиций (композиций растительных эфирных масел) на функциональное, психоемоциональное

состояние и физическую работоспособность студенток высших учебных заведений в условиях тренировочной деятельности. **Результаты исследования.** Результаты исследования свидетельствуют, что в исследуемой группе наблюдается тенденция к улучшению психоэмоционального состояния, что видно из результатов теста САН, который свидетельствует, что активность повысилась с $3,6 \pm 0,5$ бала до $4,2 \pm 0,6$ балла. На 14 % повысилось настроение, желание работать, по сравнению с фоновыми показателями, выросли с $3,6 \pm 0,5$ до $4,2 \pm 0,6$ балла. Самочувствие улучшилось на 9 %. При накоплении аромакомпозиций наблюдается снижение ЧСС в покое $72,9 \pm 1,59$ ($75,9 \pm 1,56$ в начале). Показатель пульсового давления в начале исследования составил $45,6 \pm 0,87$ ед., После – $44,18 \pm 0,96$ ед. Индекс Робинсона после применения аромасансив составил $84,7 \pm 2,06$ ед., Индекс Руфье – $6,50 \pm 1,1$ балла, ЭГК изменилась с $7,11 \pm 0,27$ см до $8,35 \pm 0,23$ см. Результаты технических действий выросли в среднем от 5 до 44,1 %, показатели эффективности игровых действий при подаче выросли с 37,54 до 41,62 %; игровых действий при защите – выросли с 43,16 до 46,20 %; игровых действий в нападении – с 46,13 до 50,08 %; игровых действий в приеме – выросли с 42,38 до 48,47 %. То есть все показатели игровых действий увеличились от 9 до 19 % после педагогического эксперимента.

Ключевые слова: студенты, аромамасла, терасеты, тренировочная деятельность, функциональное состояние.

Introduction. The constant growth of training and competitive loads and associated with it increased interest in the pharmacological correction of the athlete's body, as well as rigid anti-doping control, determine the need for the systematic approach and the search for new technologies that increase the functionality and fitness of athletes. Result-oriented effects of essential oils integrated into the training process can be the essential element of such technologies.

Aromatherapy – is a perfectly clean, completely natural method for eliminating many of the negative factors, including overtraining and anxiety before competitions. It is also an effective way to prepare the athlete's body for future physical activity. All procedures are based on the human use of high-quality, clean, not containing chemical carriers or admixtures, essential oils obtained without the use of harmful technical, electrical and radiation equipment [6].

Information about the influence of essential oils on the functional state has been very contradictory up to the present time. Many recent studies have focused on the mechanisms of the influence of essential oils [7; 10].

It is known that in order to optimize the functional state and physical efficiency it is more favourable to use comfortable, pleasant multipurpose products, which combine efficiency with simplicity and accessibility. It is aromatherapy that integrates all of the above mentioned criteria. In addition, the procedures for the use of essential oils do not require additional efforts from the athlete, which is very important for his interest in these non-pharmacological products [1; 2].

Under extreme conditions, essential oils can be used to improve efficiency and memory, to increase attention and accuracy of performance [3; 4; 5].

Essential oils have not been widely used in sports yet, although it is recognized that they are useful for correction and optimization of athletes training. Some studies provide evidence of the effectiveness of the use of essential oils and their use perspectiveness during physical activity, while other authors, on the contrary, try to show the complete lack of real results [6; 8; 9].

Therefore, this research has been devoted to the study of the effectiveness of the use of aroma oils in the training activity of female students of higher educational institutions, who are engaged in sports mastery volleyball groups, to improve the training process and increase the effectiveness of training activities.

The purpose of the research is to find out the result-oriented effects of aroma compositions (compositions of herbal essential oils) on functional, psycho-emotional state and physical capacity of students of higher educational institutions during training activities.

The material and methods of the research include theoretical analysis and review of scientific and methodological literature, interviews with specialists, pedagogical observation, pedagogical experiment, medical and biological methods, methods of mathematical statistics.

In accordance with the aim and tasks of the study, the treatment group (TG, n = 23) was formed. It included first- and second-year female students, who were engaged in sports mastery volleyball group. We obtained written consents of all participants to participate in our research. The research was conducted on the basis of Kyiv National Economic University of Economic named after Vadym Getman

Research results and discussion. A recent review of the literature on this problem has found out that in practice, specialists often use not one essential oil but mixtures of various essential oils, that is, aroma

compositions. Therefore, we used the aroma composition “The Clear Mind” of the national brand “Aromatica”, which consisted of:

- natural grapefruit essential oil – acts as a tonic, relieves depression, anxiety and stress, lightens one’s mood, stimulates the brain, improves work capacity, helps to overcome mental fatigue and lethargy.
- natural orange essential oil – helps to cope with aggression and anger.
- natural cinnamon essential oil – helps to cope with aggression and anger. Lightens one’s mood, helps to relieve depression, stimulates the brain. Inspires, awakens intuition, returns a zest for life.
- natural ginger essential oil – calms the nervous system, increases brain and vision acuity, improves memory and concentration of attention. It acts as a tonic, and helps to overcome mental, emotional and physical fatigue.

In the preparatory part of the training session, 4 times a week, for 35 days, while doing physical exercises the treatment group inhaled a composition of herbal essential oils “The Clear Mind” of the national brand “Aromatica”, in a concentration of 0.1–0.15 mg / m³ for 25 minutes.

In addition to the combined developing exercises, a set of physical exercises with terasets, where a special latex tape was used as a shock absorber, was included in the preparatory part. This tape has different degrees of resistance and is fixed on wrists and ankles. The set of physical exercises included 15 dynamic shoulder, back, chest, legs and arms exercises, which were performed in aerobic mode. Rhythmic musical accompaniment was used to create a more favourable atmosphere for performing experimental task.

The results of the research showed that changes in the main indicators influencing the adaptation to the proposed loads took place due to the prolonged impact of aroma compositions.

To estimate the psycho-emotional state of the female students, we used the SAM questionnaire (state of health, activity, mood) [11], which is aimed at quick assessment of the psycho-emotional state of a person at a given moment. All three indicators, which are defined by the above stated method, are closely interrelated. The results obtained are presented in Table 1.

Table 1

The Results Obtained on the Basis of Accumulation of Aroma Compositions

Methods	Indicators	After using aroma compositions				Increase %	
		Before the experiment	After 10 train. sessions	After 20 train. sessions	In 10 days after the exp.	1	2
Test SAM (point)	State of Health	3.9±09	4.4±08	4.3±07	4.1±06	9	5
	Activity	3.6±05	3.8±08	4.2±06	3.9±08	14	7
	Mood	3.8±07	4.2±06	4.4±09	4.2±07	14	10
	Desire to work	3.6±05	3.9±07	4.2±06	4.1±09	14	10
Estimation of the functional state of the cardiovascular system (mmHg, U. / min)	SBP	119.2±2.5	118.3±2.7	116.8±1.9	117.5±2,1	2	1
	DBP	73.8±1.12	73.1±1.19	72.0±1.16	73.4±1,17	2	1
	Heart rate	75.9±1.56	74.8±1.46	72.3±1.51	72.9±1,59	5	4
	PP (pulse, pressure)	45.6±0.87	45.2±0.91	44.8±0.81	44.18±0.96	2	3
Ruffier Index		7.09±1.3	6.86±1.5	6.50±1.1	6.64±1.0	9	7
Robinson index		9.,7±2.56	87.5±2.37	84.7±2.06	85.6±1.75	7	6
Chest excursion		7.11±0.27	7.53±0.32	8.35±0.23	8.33±0.41	15	15

Note: 1 -% increset after 20 training sessions; 2% increase in 10 days after the completion.

As can be seen from the results of the SAM test in the treatment group there is a tendency to improve the psycho-emotional state. The activity increased from 3.6 ± 0.5 points to 4.2 ± 0.6 points. The mood has also increased by 14%, which suggests the positive influence of aroma oils on the psycho-emotional state.

The desire to work compared with the background indicators, which were 3.6 ± 0.5 points, after 10 training sessions reached 3.9 ± 0.7 points and in 20 days -4.2 ± 0.6 points. They also improved the state of health, which they rated in 4.3 ± 0.7 points compared with the background index -3.9 ± 0.9 points.

When analyzing the results in the treatment group it was found that with the accumulation of aroma compositions the decrease in heart rate at rest is 72.9 ± 1.59 (75.9 ± 1.56 in the beginning). We interpret this as a factor in expanding the adaptive capacity of the body. The pulse pressure index at the beginning of the research was 45.6 ± 0.87 , and after the research, this index was 44.18 ± 0.96 .

Index of the functional capacity of the heart was calculated according to Robinson index. This is a key indicator of the functional state of cardiovascular system. The smaller it is at rest, the higher are the spare capacities of cardiovascular system, the higher is its fitness. The research has shown that the overall rate index was at around 90.7 ± 2.56 , indicating the lack of functional capacity of cardiovascular system of female volleyball players. After a long-term use of aroma sessions this figure decreased to 84.7 ± 2.06 , which, according to the table of index calculation, indicates that the functional reserves of cardiovascular system are normal.

The functional capacity of cardiovascular system to adapt to physical activity was calculated according to Ruffier Index. At the beginning of the research the index was 7.09 ± 1.3 points, while at the end of the study after aromatherapy in combination with breathing and combined developing exercises and also physical exercises with terasets, this index was 6.50 ± 1.1 points, which corresponds to a satisfactory response to physical activity. However, we believe that this indicator may be higher in this group.

Well trained breathing is one of the requirements to improve athletic mastery and achieve high efficiency, one of the ways of active rest during the rehabilitation. We have obtained comprehensive results proving that chest excursion in the treatment group of female volleyball players changed from 7.11 ± 0.27 cm to 8.35 ± 0.23 cm, which corresponds to a good excursion.

Besides, female students of the treatment group on the background of a long-term action of aroma oils demonstrated the tendency to improve the training activity as compared with the initial state of indicators. The results of technical actions in comparison with the initial state of indicators increased on average from 5% to 44.1% , which can be observe in Table 2.

Table 2

Technical and Physical Efficiency while Applying Aroma Compositions

№	Control tests	Treatment group					
		Before the experiment	After the experiment	difference		t	p
		M ± m	M ± m	unit	%		
1	Run 20 m (s)	4.0 ± 0.04	3.6 ± 0.03	0.38	9.5	7.6	<0.05
2	Jump speed (once every 20 s)	26.6 ± 0.7	32.8 ± 0.6	6.2	23.3	6.58	<0.05
3	Accuracy of ball hitting in jump (%)	37.9 ± 1.8	54.6 ± 1.8	16.7	44.1	6.56	<0.05
4	The height of the jump	$41, 9 \pm 2,2$	$44 3 \pm 3.5$	2.4	5	0.58	> 0.05
5	Forward ball hitting without a jump at the wall	26.0 ± 0.9	28.4 ± 0.72	2.4	9.2	2.08	<0.05

The data of Table 3 indicate that as a result of a prolonged action of a mixture of herbal oils (aroma compositions) used during the preparatory part of the training session with first- and second-year

female students, who were engaged in sports mastery volleyball group, there have been positive changes in the indicators of gaming actions in terms of training activities.

Indicators of the effectiveness of gaming actions while serving the ball grew from 37.54% to 41.62%; gaming activities in the defense increased from 43.16% to 46.20%; gaming actions in the attack – from 46.13% to 50.08 %; gaming actions while receiving the ball increased from 42.38% to 48.47 %. That is, all the indicators of gaming activities increased from 9% to 19%.

Table 3

Indicators of the Effectiveness of Gaming Actions while Applying Aroma Compositions

		performance indicators (%)			
		Actions while serving the ball	Action while receiving the ball	Actions in the defense	Actions in the attack
Beginning		37.54	42.38	43.16	46.13
End		41.62	48.47	46.20	50.08
Dynamics of indicators	Unit	4.08	6.09	3.04	3.95
	%	15	19	9	11

Conclusions and perspectives for further research. The received increase in all the indicators has shown the correctness of the chosen direction. On the basis of the obtained results, it can be stated that the use of an integrated combination of aromatic sessions and training aids in the preparatory part of the training session, which includes not only combined developing exercises, but also complex exercises with terasetes, make positive impact on the psycho-emotional, functional state of cardiovascular and respiratory systems and on the increase of the level of training activity of female students of higher educational institutions, engaged in volleyball.

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