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## Application of measures to recover students' health after sports at Thai Nguyen medical colleges

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### Abstract

To recover students' health after sports is a really important activity. However, this activity has not been paid enough attention currently. Based on the result of assessing the current situation of physical education for students at Thai Nguyen Medical College, the authors have selected 03 measures to recover students' health after sports. They include massage sports, using rollers, stretch muscles. The effectiveness of the applied measures is reflected through the lever of recovery of the indexes after the experiment.

**Keywords:** Recover, measures, applications, effectiveness

### Introduction

#### Problem

Practice sports regularly will bring significant changes in body shape and bring many health benefits. Muscles will grow, fat loss will improve, insulin sensitivity will be improved, inflammation will be reduced, heart health will be better, and overall will be healthier. But you need to give your body time for those good changes to take place, before putting new pressure on your body again. The effects of exercise will trigger. The body's immune system and repair damage. As the body's tissues, from muscles to bones, to the heart and lungs, recover from exercise, over time they become firmer than they were before. Thanks to that, the next time you do the same exercises, the practitioner will not suffer as much damage anymore.

The issue of recovery after sports training has now been interested and researched by many scientists. However, the published works are mainly focused on the recovery of athletes after training and competition, and for non-sports students, most of these concepts are completely new, that comes from the content and volume of movement that they receive in the process of learning and practicing, which is different from professional athletes. However, it can be seen that not all students can complete the volume required by the teacher, even being overworked in practice, which makes the practitioner physically injured after studying and practicing. Stemming from the above reasons, the authors conducted the study "Applying recovery measures after sports training for students of Thai Nguyen Medical College" to contribute to improving the teaching and learning efficiency of the unit.

#### Research Methods

To carry out this research, the authors used a number of methods such as: Method of analysis and synthesis of documents; Interview method; Method of pedagogical observation; Method of biomedical examination; Experimental method of pedagogy; Statistical mathematical methods.

#### Research results and discuss

##### 1. Assessment of the current situation and development of measures to assess recovery after sports training for students of Thai Nguyen Medical College.

Determination of recovery indicators: There are many methods to assess the recovery status of the practitioner (Assoc. The simplest and easiest method is to monitor the change of the indicators (monitoring the change of heart rate, arterial blood pressure index, body weight, athlete's training log.) For students or sports participants also assess the ability to recover as above.

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From the conclusions of the published scientific works, the authors selected and used the following indicators: baseline TSM, baseline BP, single-complex reflex and cognitive ability (landolt open-loop test) to test and assess the recovery level of students at Thai Nguyen Medical College. However, based on the actual situation of physical facilities, we only evaluate through the baseline SM, baseline HA, and landolt open loop test.

**Table 1:** Status of psycho-physiological rehabilitation of students at Thai Nguyen Medical College before using rehabilitative therapy

Index	Baseline TSM	Blood pressure		Landolt open loop test
		Max	Min	
$\bar{X}$	0.48	0.25	0.39	0.07
$\delta$	0.56	0.19	0.33	0.06
$C_v$	124.22	72.81	81.34	81.56

TSM base  $\bar{X}^- = 62.21 \pm 8.12$  (l/p) increased (0.47%); BP max  $\bar{X}^- = 114.66 \pm 6.57$  mmHg increase (0.23%); BP min  $\bar{X}^- = 72.06 \pm 4.61$  mmHg, increase (0.38%); Analytical skills  $\bar{X}^- = 1.59 \pm 1.15$ , an increase of 0.07%. Thereby, it is shown that the volume and intensity of exercise of the previous day on the student's body caused a state of fatigue on body weight, cardiovascular system, nervous system and neuromuscular system of the body.

## 2. Applying and evaluating the effectiveness of restorative therapies for students of Thai Nguyen Medical College

To select rehabilitative therapies for students of Thai Nguyen Medical College, the authors followed these steps:

**Table 2:** Test results through 2 interviews according to the statistical method

Number	Therapy	1st (n=24)		2nd (n=24)		Reliability
		Point	Percentage	Point	Percentage	
1	Restorative massage	72	100.00	72	100.00	0.10
2	Nutrition	56	77.78	54	75.00	0.03
3	Acupuncture	62	86.11	55	76.39	0.01
4	Acupressure	52	72.22	55	76.39	0.04
5	Muscle tension	68	94.44	70	97.22	0.08
6	Using foam roller	60	83.33	62	86.11	0.08

Based on the test results in Table 2, the topic excludes the rehabilitative therapies with the reliability  $r < 0.05$  because the observed significance level of the test does not have a coincidence between the two interviews and the selection of the therapies. recovery was coincidental, with the rate of over 80% of people agreeing through 02 interviews, and at the same time excluding therapies with a rate of less than 80%.

From the above 06 rehabilitative therapies, based on actual conditions and the results of the interview, 03 post-exercise recovery therapies for students of Thai Nguyen Medical College have been selected, including: Massage rebound squeeze; Muscle tension; Use the roller.

## 3. Application and evaluation of the effectiveness of selected restorative therapies

Through the research results, the authors have selected 03 recovery methods for students after exercise, including: Recovery massage, Muscle tension, Roller use, and conducted an experiment for 1 semester. Time to implement from 10 to 15 minutes after each session and coordinate between measures together.

**Step 1:** Systematize the recovery therapies of domestic and foreign authors used in recovery after training and competition.

**Step 2:** Interviewing experts, choosing recovery therapies for students of Thai Nguyen Medical College.

### Systematization of used rehabilitative therapies

From the referenced studies, the topic summarizes the following rehabilitative therapies:

- Restorative massage - Laser therapy
- Acupressure - Hydraulic bath
- Measures of muscle tension - Dry and wet sauna
- Relax swim - En-Vibe mechanical vibrator
- Nutrition - Electromagnetic fields
- Measure Endomed 484 - Acupuncture
- Method of using foam roller FOAM ROLLING - Stretching measure (STRETCHING)

From the above-mentioned rehabilitative therapies, based on actual conditions, the authors have selected recovery measures for students of Thai Nguyen Medical College as follows: Recovery massage; Nutrition; Acupuncture; Acupressure; Muscle tension; Use the roller.

### Interview to choose the method

From the results of the selection of the above content, to ensure the objectivity and reliability of the contents of the evaluation of the topic, conduct an expert interview. From the statistical results through 2 interviews, the topic conduct the test to assess the reliability and homogeneity between the two interviews. The results are presented in Table 2:

### Procedure

- Stretch: 05 minutes
- Muscle tension combined with restorative massage: 10 minutes
- Using roller: 05 minute
- Restorative massage: 10 minutes

After 1 lesson, it is not possible to apply all measures at the same time, so the author team conducts alternately: the first session of muscle tension and muscle tension combined with massage, the next session uses rollers and recovery massage. The sequence changes after each lesson.

### Evaluate the impact of rehabilitative therapies on students' cardiovascular function

Test results of TSM base  $\bar{X}^- = 65.75 \pm 1.21$  (times/minute); HA max  $\bar{X}^- = 114.09 \pm 0.86$  and HA min  $\bar{X}^- = 71.72 \pm 1.33$ . The authors assessed the effectiveness of the recovery of the above indicators before the experiment (natural recovery) and after the experiment (recovery with the application of selected therapies). The results are presented in Table 3.

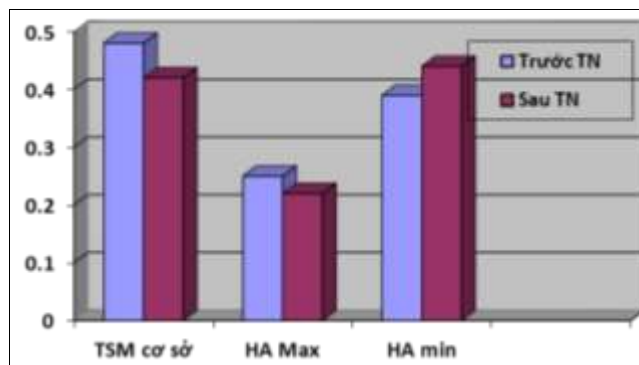
**Table 3:** Comparison of baseline TSM, baseline BP of Medical College students before and after the experiment (n=100)

Research index Stats	Baseline TSM			HA max			HA min		
	Before	After	Changes	Before	After	Changes	Before	After	Changes
$\bar{X}$	0.48	0.42	-0.05	0.25	0.22	-0.03	0.39	0.44	0.06
$\delta$	0.56	0.52		0.19	0.13		0.33	0.35	
$C_v$	124.22	132.35		72.81	70.88		81.34	80.06	
$t_{\text{tính}}$	2.48			3.28			6.68		

The results of Table 3 show that, on average, the baseline TSM recovery level after the experiment compared to before the experiment of students at Thai Nguyen Medical College decreased by 0.05% on average; index before experiment was 0.48%, after experiment was 0.42% with t calculation = 2.48 > table. It proves that the recovery level of the baseline TSM has been significantly improved and the difference in  $\bar{X}$  is statistically significant with the probability threshold  $P \leq 0.05$ . The change in HA max after the experiment compared to before the experiment decreased by 0.03%; index before experiment was 0.25%, after experiment was 0.22% with t calculation = 3.28 > table.

The change of HA min after the experiment compared to before the experiment increased by 0.06%; The index before the experiment was 0.39%, after the experiment was 0.44% with t = 6.68 > t table. It shows that the recovery level of HA max and HA min has improved markedly and there is a difference in  $\bar{X}$  with statistical significance with probability threshold  $P \leq 0.05$ .

Through the recovery process, the level of recovery in baseline TSM of Thai Nguyen Medical College students after the experiment was better than before the experiment. It has been shown that rehabilitative therapies have a good effect on the recovery of the cardiovascular system (Figure 1).



**Fig 1:** The level of recovery of baseline TSM, baseline BP of students of Thai Nguyen Medical College before and after the experiment

### Effect of restorative therapies on the functional index of the nervous system

**Table 4:** Comparison of the level of recovery of problem solving skills of university students Thai Nguyen Medical College before and after the experiment

Research index Stats	Landolt open loop test		
	Before	After	Changes
$\bar{X}$	0.07	0.14	0.07
$\delta$	0.06	0.09	
$C_v$	80.56	60.63	
$t_{\text{tính}}$	2.17		

Table 4 shows that the level of change of problem solving skills after experiment compared to before experiment increased by 0.07%; index before experiment was 0.07%, after experiment was 0.14% with t calculation= 2.17 > table. It proves that the recovery level of the problem solving ability has been significantly improved and there is a statistically significant difference in  $\bar{X}$  with the probability threshold  $P \leq 0.05$ . From there, it can be seen that the selected methods have had a positive effect on the recovery process of students.

### Conclusion

The process of examining and evaluating the recovery status of students at Thai Nguyen Medical College showed that: The cardiovascular system has a relatively fast recovery rate, the nervous system, neuromuscular system has a recovery speed. Recovery is slower and may not be fully recovered after a night's rest.

Based on the results obtained after the interview, the author has selected 03 recovery measures to apply to students after exercise, including: Sports massage, using rollers, muscle tension. The effectiveness of the applied measures shown in the recovery level of weight indexes, BP max, BP min, baseline TSM, and cognitive control was significantly improved.

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