

## PRINCIPLES OF DEVELOPING A WELL-ROUNDED PROGRAM OF PHYSICAL REHABILITATION FOR FEMALE STUDENTS IN THE SPECIAL MEDICAL GROUP WITH CONSIDERATION OF PHYSICAL ACTIVITY IMPAIRMENT

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**Abstract.** *Purpose:* to highlight the main provisions of a comprehensive physical rehabilitation program for students of special medical group based on violations of the motor capacity. *Material:* testing 24 students of special medical group and the same number of their healthy peers on standardized tests of physical qualities. To reflect the movement disorders applied functional movement screen. *Results:* a program of rehabilitation of the students included: lifestyle modification; morning hygienic gymnastics; kinesitherapy (using yoga fitness, functional training); aerobic exercise (swimming, Nordic Walking, jogging, aerobics wellness); massage. First presented a unified approach to working with students of special medical groups - selection based on load capacity motor disorders according to the results of tests of functional movement screen. The complexity of the impact of the program involves the impact on the physical, social and mental health components. *Conclusions:* the author's program of physical rehabilitation of students of special medical group is complex.

**Keywords:** students, special medical groups, physical rehabilitation, movement capacity.

### Introduction

It has been commonly accepted that epidemic of chronic not catching diseases (CNCD) is to certain extent connected with way of life and caused by it risk factors. This fact is directly connected with social, economical and ecological determinants of health [8, 16, 21]. They include education, availability of healthy eating, psycho-social stress, accessibility of health protection services and infrastructures, supporting healthy life style. Besides, there are other risk factors of CNCD, connected with way of person's life: tobacco smoking, wrong eating, insufficient physical activity and alcohol. Correction of the mentioned above factors will facilitate individual risk owing to influence on such biological factors as excessive body mass, arterial hyper-tension, disordering of fat and carbohydrate metabolism [10, 12, 16, 20].

Youth is the most vulnerable and strategically important for state strata of population. That is why main priority of modern medicine and rehabilitation shall be prophylaxis, oriented on increasing of youth's information about after effects of wrong life style, on early detection of these after effects and quick, full fledged correction of the detected defects with non-medical methods [8].

Objective indicator of students' unhealthy condition is the fact that with every year quantity of special health groups' members increases.

Modern physical education system for higher educational establishments' students in Ukraine is not able to ensure sufficiently normal life functioning, health protection and recreation of workability. The reasons are: too old methodic system of students' physical education, absence of governmentally approved programs of innovation means and technologies of physical education. Besides, recent years, rehabilitation direction of physical culture classes as mean for health and workability recreation has been being propagated. For example, in National doctrine of physical culture and sports development №1148/2004, dt. 28.09.2004 it is stressed that it is necessary to develop health related measures with the help of physical rehabilitation methods. One more problem of practical work with special health groups' students is absence of unified multifunctional criterion of students' differentiation inside every group. That is why working out of new programs of physical rehabilitation, considering, on the one hand, detected pathologies and, on the other hand, students' interests in modern kinds of physical functioning, has been still remaining urgent and demanded.

### Purpose, tasks of the work, material and methods

*The purpose of the research:* is to render main principles of author's program for girls students of special health groups, considering defects of motor functioning.

*Material and methods of the research:* theoretical analysis and generalization of scientific-methodic literature and author's experience as the basis of creation of author's program for special health groups' girl students, considering defects of motor functioning.

We tested 24 girl students of special health groups (SHG) of Ivano-Frankivsk national medical university and the same quantity of their healthy peers who composed control group. Girl students of special health group were divided into SHG1 and SHG2 (12 girls in every group). In further tests SHG 1 was a group of comparison as far as girl students of this group were taught as per "Typical program of academic discipline for higher II-IV accreditation levels' medical higher educational establishments' students" [13]. For SHG 2 girl students, author's physical rehabilitation program was worked out.

Main unified criteria for of substantiation of girl students' functional state assessment we took determination of motor ability. This parameter was assessed in complex way by two methods. The first was testing with the help of standard tests for determination of physical skills, envisaged for main and special health groups. The second method of motor defects' detection was functional movement screen (FMS). FMS is an innovative system, which is used for assessment of quality of fulfilled exercises' and stabilizing movements' fulfillment. These movements create unusual situation for organism, in which its weakness and unbalanced condition become evident in case of absence of appropriate balance and mobility. Advantage of FMS is that coach-rehabilitator works for improvement of certain person's physical fitness and applies this system, having simple quantitative method of basic motor functioning's assessment [4].

### **Results of the research**

In the course of working out of rehabilitation program for SHG girl students, considering defects of motor functioning we based on results of previously conducted tests. The received data (SHG girl students' lagging behind their healthy peers by indicators of strength, flexibility, dexterity, test results by all FMS exercises) substantiate conclusion that the tested girl students require serious improvement of their health.

With creation of physical rehabilitation program we considered methodic principle of "Typical program of academic disciplines for II-IV accreditation medical higher educational establishments' SHG students". This program regulates content of in-class and out-of-class learning of main and special health groups students and determine sequence of physical skills' mastering.

The worked out program of complex rehabilitation of SHG girl students, considering defects of motor functioning included: modifying of life style; morning hygienic exercises, kinesiotherapy (including fitness-yoga exercises, functional training, aerobic loads – swimming, health related walking, jogging, health related aerobics) massage. With working out of the program we followed requirements of adequacy, strict dozing of physical loads, their systemic character, gradual expansion of means for ensuring of complex influence on internal organs and muscular skeletal apparatus.

Complex program of physical rehabilitation was being implemented during all academic year in three stages: preparatory, main and supporting (see fig.1).

### **Modifying of life style**

Girl students were given recommendations concerning modifying their life style, which were worked out in compliance with Countrywide Noncommunicable Diseases Intervention Programme – CINDI. This program was officially implemented in practice of prophylaxis-medical institutions of Ukraine [11, 12]. The purpose was reduction of not catching diseases' progressing by elimination of risk factors. The worked out recommendations included:

- Modifying of eating:
  - Eating of mainly vegetable food, shortening of meat food;
  - Eating minimum 400 g of different vegetables and fruits, preferably fresh;
  - Eating of bread, grain products, pasta, rice or potato several times a day;
  - Reduce consuming of fats;
  - Replace fats by vegetable oils or soft margarines;
  - Cook on steam or stew, bake (it reduces quantity of used fat);
  - Replace meat products with beans, fish, chicken;
  - Use milk and milk products with low content of fat and salt;
  - Use food with low content of sugar, restrict usage of sweets, sweet drinks, refined sugar; prefer product with low content of salt (maximum 5 g per day);
- Modifying of harmful habits:
  - Restrict taking alcohol up to 20 ml of ethanol per day or don't take it at all;
  - Stop tobacco smoking; avoid passive smoking.
- Modifying of everyday physical loads: apply moderate everyday physical loads (for example don't use lift, reduce usage of municipal transport).

Considering determined with questioning low interest in health related trainings and rare attending of sport circles, we conducted additionally talks-consultations with girl students about influence of physical exercises on human organism and role of physical functioning in rehabilitation and preservation of health.

### **Program of kinesiotherapy**

The purpose of kinesiotherapy was correction of motor functioning's defects, improvement of organism's general condition through improvement of internal organs' functioning, which was disordered as a result of main disease; increasing of functional reserve of muscular skeletal apparatus, elimination of physical inactivity, improvement of girl-students' psycho-emotional state.

When working out of rehabilitation program we considered students' unsatisfactory knowledge of modern approaches to health improvement, low level of their interest to health related trainings and high in-class academic loads of medical university students. That is why, in our trainings we tried to arise girl-students' interest to modern systems of fitness during in-class trainings. For this purpose we chose fitness yoga, functional training and health related aerobic. Choice of health related functioning's kinds was justified by their different orientation and possibility to choose exercises according to results of FMS tests as well as to physical qualities to be corrected.

stage	month	Mode of training	task	methods					
preparatory	9	moderate	<i>Initial control</i>	RGG	Every day (independent trainings)	Program of kinetic therapy	Modifying of life style	Correction of eating, giving up harmful habits, increase of general physical activity	massage
			Adaptation of all organism's systems to increasing physical loads; mastering of the offered corrections of motor functioning's defects; development of physical qualities; general hardening; correction of psycho-emotional state; Motivation for healthy life style	Fitness-yoga	Twice a week (in-class trainings) Once per 2 weeks (independent trainings)				
	10		Functional training	Once a week – in-class training Twice per 2 weeks (independent trainings)					
			Health related walking, jogging	Every day (independent trainings)					
main	11	moderate-training	<i>Intermediate control</i>	RGG	Every day (independent trainings)				
	12		Improvement of cardiovascular, respiratory, vegetative-nervous systems' functions; correction of motor functioning's defects; further progressing of physical qualities; improvement of posture; hardening	Functional training	Once per 2 weeks (in-class trainings) Twice per 2 weeks (independent trainings)				
	1			swimming	Twice a week (in-class trainings)				
	2			Health related walking	Every day (independent trainings)				
	3			RGG	Every day (independent trainings)				
supporting	4	training	<i>Intermediate control</i>	RGG	Every day (independent trainings)				
			Fixing of achieved results, further improvement and stabilizing of internal organs functioning; further widening of physical functioning; maintenance of achieved physical workability; Increase of general endurance; further improvement of physical qualities	Health related aerobics	3 times per 2 weeks (in-class trainings)				
	5		Functional training	3 times per 2 weeks (independent trainings)					
			Health related walking, jogging	Every day (independent trainings)					
			<i>Final control</i>						

Fig.1. Block diagram of complex rehabilitation program for girl students of special health groups, considering defects of motor functioning

Fitness yoga is fulfillment of yoga asana as specific physical exercises without consideration of yoga philosophy [2, 15]. Considering high therapeutic effectiveness of yoga [17, 19] and low level of girl-students physical fitness (except correcting effect of asana) these trainings had one more purposes – girl-students' adaptation to regular controlled physical loads, development of physical qualities (mainly flexibility and endurance), adaptation of organism to increasing physical loads.

Functional training (FT) is trainings with the help of own body mass with the help of power equipment and is aimed to development of cardio-vascular system's endurance, coordination, general endurance, muscular strength, flexibility and etc. [1, 18]. FT forms skills in integration of separate physical qualities in something whole on the base of creation of stereotypes of rational, anti-traumatic, correct fulfillment of domestic and professional movements [1, 24]. In the process of mastering of correct movements' models for everyday, recreational and professional functioning risk of muscular-skeletal apparatus's traumas, backbone diseases of girl students reduced. In our rehabilitation program we used FT with application of band expanders. Advantages of them were: universal character (trainings of all muscular groups); individual dosing for girl students with different levels of physical fitness due to regulation of expander's stretching. Elasticity of this equipment excludes sharp movements and does not allow making exercises easier. Besides, such exercises are anti-traumatic.

Aerobic is a number of physical activity kinds, which are combined by some common features and musical accompaniment [9, 15, 23]. Our physical rehabilitation program includes health related aerobic, which is characterized by simplicity of applied means, possibility of control and self control of health condition, positive emotional background of trainings, dancing character of exercises.

For obtaining of maximal health related effect, in the process of trainings there must appear expressed energy losses, simultaneously with smooth durable loading of cardio-vascular and respiratory systems that must have aerobic character [3, 5, 9, 14, 15, 22]. That is why, besides health related aerobics, girl students received aerobic loads from health related walking, jogging, swimming. With gradual adaptation of organism to increasing physical load intensity of exercises increased at the account of increasing of distance and time of fulfillment.

Program of kinesiotherapy was implemented in in-class and independent trainings. At in-class trainings we gave theoretical basis of different health related systems, trained technique of different exercises, corrected mistakes. Every training consisted of main, preparatory and final parts. Choice of exercises for kinesiotherapy was individual, considering disease of each girl students.

In preparatory part girl students fulfilled general exercises (different at different stages of rehabilitation -0 fitness yoga, functional training, health related aerobic). Exercises were fulfilled for main muscular groups of legs, arms, torso first slowly and then with moderate temp. Special attention was paid to deep and smooth breathing. Exercises, which require great efforts, were not recommended.

During main part we trained technique of movements and training itself. Exercises were selected individually, considering defects of motor functioning, according to specificity of kinesiotherapy exercises (fitness yoga, functional training, health related aerobic) and counter indications. We followed principle of scattering of load. If it was impossible without distortion of exercise's mastering process, we used "re-switching of movements" in the form of short-term movements by fresh muscles.

Final part consisted of exercises for relaxation and breathing exercises. Its purpose was recreation of functional state of girl students' organisms, which were caused by physical loads of main part.

#### **Massage**

For further hardening of organism, improvement of health, elimination of stress, improvement of adaptation to increasing of physical loads and recreation after trainings girl students passed course of general health related self-massage.

Implementation of the program resulted in confident improvement of tested physical fitness indicators and efficiency of fulfilled FMS exercises in SHG2 in comparison with SHF1 CMГ1 [6, 7].

#### **Discussion**

The received in the process of our researches data prove acute character of students' health (in SHG groups) problem (E.G. Bulych, 1986; O.D. Dubogay, A.V. Tsios, M.V. Yevtushok, 2012; O.I. Mozgoviy, 2012), demand in seeking of new basic criteria for training of such groups with so non-uniform rehabilitation contingent (O.Yu. Ivanochko, 2009; O.P. Kanysheva, 2011; A.A. Yerokhina, 2014) They also prove urgency of health correction for such groups of youth (O.V. Kuznetsova, 2005; V.G. Babenko, L.G. Yevdokimova, Yu.I. Tupitsa, G.L. Khapsalis, 2011).

In our program for the first time we present new unified approach to work with students of special health groups – selection of physical loads, considering current main disease and defects of motor functioning by FMS tests' results. It permits to individualize kinesiotherapy programs with selection of exercises, which offer modern, interesting for students, health related trainings: fitness yoga, functional training, health related aerobic. Besides, the work of coach on creation of uniform by certain features groups during training becomes easier.

Complex character of this program's influence stipulates influence on not only physical component of health at the account of physical exercise. Social and psychological components are also positively change at the account of better self feeling, rising of level of everyday activity, creation of up-to-date self image.

### Conclusions

The presented author's program of physical rehabilitation for special health group girl students, considering defects of motor functioning was worked out on the base of fulfillment of functional movements' screen exercises and assessment of physical fitness. The program is of complex character and includes the following elements: modifying of life style, methodic of kinesiotherapy (morning exercises, fitness aerobic), functional trainings, aerobic trainings (health related walking, jogging, swimming, aerobic), massage. All these permit to influence on main health components – physical, social and psychic.

*The prospects of further work* in this direction imply detail analysis of influence of the worked out program on functioning of special health group girl students' organisms.

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### Conflict of interests

The author declares absence of any conflict of interests of any kind.

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