FEATURES OF CONSTRUCTION OF THE TRAINING PROCESS SKIERS AGED 17-18 YEARS TO COMPETE IN DIFFERENT STYLES OF SKIING

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Annotation. The work is devoted to the improvement of precompetitive preparation of skiers, taking into account the need to participate in competitions of different styles of skiing. The experiment included 20 athletes aged 17-18 years. Isolated model characteristics of athletes who successfully perform classic and skating style of movement. The range of indicators of physical fitness of athletes, which is the norm for this level of qualification. The technique of constructing precompetitive preparation of athletes on the basis of a combination of style of movement. It was established experimentally that the combination of training sessions during the day improves athletic performance in racing classic and skating style. In this case, primary and secondary occupation to carry out a different style of skiing with a change of their rotation on the next day.

Key words: ski races, classic technique, skating technique, racing, researches, methods, training.

Introduction

At congress FiS 1987 skiing styles were divided into two ones: classic (traditional) and free style, which stipulates using of skating techniques [5-7].

Competition programs of ski-racers, starting from regional championships and winter Olympic Games including, envisage 2 styles of racing. Besides, skiing of alternating style (skiatlon) is widely used; this method combines classic and skating styles in one racing [1-4,8,9]. It requires special attention to development of training process, with combining of two ski styles.

The problem of pre-competition trainings of classic style skiing is studied in a number of works, but there is no researches on pre-competition trainings of 17-18 years old ski racers, with combination of classic and skating styles.

Besides, recent years methodic of sportsmen's preparation, based on individual, morphological, physiological and psychological features of organism, has changed. That is why, scientific and practical grounding as well as development of system of pre-competition training with different skiing styles, considering biological peculiarities of young sportsmen, is rather urgent problem.

The work has been fulfilled as per plan of scientific & research works of Kharkiv state academy of physical culture.

Purpose, tasks of the work, material and

The purpose of the work: experimental foundation of methodic of 17-18 old skiers' training for participation in different skiing styles' competitions.

The tasks of the researches:

1. Analysis of existing methodic of pre-competition ski-racers' training.
2. Determination of optimal morphological-functional models of ski-racers for successful participation in competitions with classic and skating styles of skiing.
3. Development of the most rational methodic of sportsmen's pre-competition training for participation in competitions with different styles of skiing.

Organization of the research. Model characteristics of classic and skating styles' advanced ski-racers, which considered anthropometric characteristics and indicators of sportsmen's functional state, were developed.

The second stage of the research was conducted in conditions of training session (28 days). Sportsmen were divided into two groups: the first – control, in which traditional training methodic was used (alternating of ski styles each day), and the second – experimental, in which the developed by us methodic was applied. Every group consisted of 20 sportsmen.

Construction of trainings, both of control and experimental groups, considered up-to-date demands to training process: orientation of exercises, their intensity, duration of series and interval for rest after loads. In both groups trainings were carried out at the same time; after trainings results were registered. Difference between results of both groups was calculated then.

The methods of the research. We used methods of anthropo-scopy and anthropometry. Linear sizes of body were measured. Weight-height indices and scale index by Manuvriet were calculated. Besides, we used methods of functional examinations (heart beats frequency, vital capacity of lungs, PWC_{170} and other), Skibinskiy's index was calculated; test by Rufiet-Dixon and Index of Harvard step-test (IHST) were used.

Results of the research

Anthropometric examinations of ski-racers showed confidently higher height indicators (by 2.2%), weight (by 2.5%), length of legs (by 3.0%), weight-height index (by 4.5%) ($p<0,05$) of skiers, who were better in classic style of skiing. Differences in the length of arms and index of leg were not confident ($p>0,05$) (see table 1).

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Table 1

Comparative characteristics of optimal model's anthropometric indicators of different style qualified ski-racers (n=20)

Антропометричні показники	Classic style		Skating style		t	p
	$X_1 \pm m_1$	σ_1	$X_2 \pm m_2$	σ_2		
Length of body, cm	180,00±0,91	2,87	176,00±0,97	3,06	3,54	P<0,05
Body mass, kg	70,00±0,88	2,71	68,00±0,63	2,00	2,53	<0,05
Length of arms, cm	75,00±0,56	1,76	73,00±0,58	1,83	2,03	>0,05
Length of legs, cm	108,00±0,78	2,35	104,00±0,70	2,11	2,99	<0,05
Scale index, %	89,90±0,15	0,46	87,90±0,14	0,45	0,67	>0,05
Weight-height index, kg.p.m	21,66±0,79	0,69	20,02±0,61	0,42	4,54	<0,05

Analysis of anthropometric studies shows that model characteristics of ski-racers are within 2,2 – 7,6 % from average results of testing and are confidently different (p<0,05) by most of indicators.

Correlation analysis of anthropometric indicators' dependence of classic style (r_1) and skating (r_2) styles' ski racers showed close dependence between the length of body and indicators of length of leg (r_1=0,90; r_2=0,95), length of leg (r_1=0,90; r_2=0,91), length of arms (r_2=0,92), length of leg and index of leg (r_1=0,70; r_2=0,89), weight-height index and weight (r_1=0,52; r_2=0,75), length of arms and indicators of length of legs (r_2=0,87) and index of leg (r_2=0,86).

Analysis of testing of organism's functions and systems permitted to determine the range of physical preparedness indicators, which corresponds to middle level and is a normative for the given qualification level. High level is the highest target for general and special physical preparation.

Difference between indictors, which reflect classic and skating styles races/ influence on cardio-vascular system, is: test by Rufiet-Dixon – 12%, frequency of breathing under load – 7.7%, heart beats frequency after loads – 4.3%, coefficient of endurance – 3.75% and Harvard step-test – 2.6% (p<0,05).

The obtained results permitted to work out model characteristics of optimal physical parameters for successful classic and skating styles skiing at competitions.

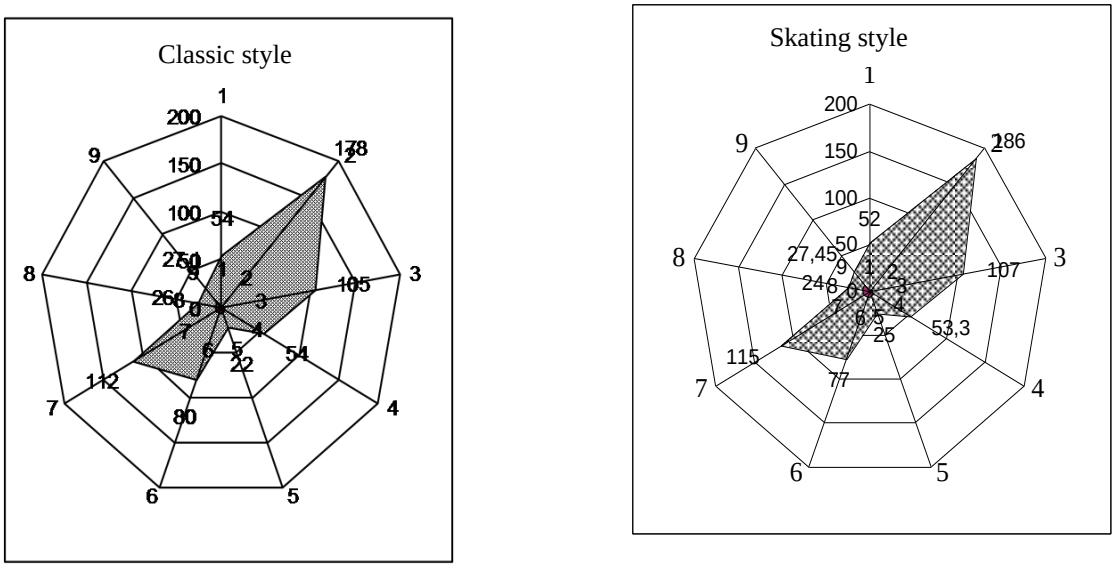

Fig.1.Model characteristics of indicators of qualified ski-racers, who successfully participate in competitions in classic and skating styles, organism's functional state.

Legend: 1- heart beats frequency (HBF) in rest, beats per minute (bts.p.min $^{-1}$); 2 – heart beats frequency (HBF) after loads, beats per minute (b.p.min $^{-1}$); 3 – PWC_{170}, conventional units (cov.un.); 4 – vital capacity of lungs (VCL), liters (l); 5- test by Rufiet-Dixon, conventional units (conv.un.); 6 – coefficient of endurance, conventional units (conv.un.); 7 – IHST, conventional units (conv.un.); 8 – quantity of breathing per minute; 9 – Skibinskiy's index, milliliter per kilogram (ml.p.kg).

Thus, different styles of skiing put forward special demands for sportsmen's organisms. These demands require reconstruction of movements' structure in compliance with technique of skiing as well as further training of sportsman organism's functional systems.

This statement determined searching of optimal approaches to planning of training process, considering both skiing styles, especially in the period of preparation for main competitions of season.

In pre-competition period in control group traditional skiers' training methodic was used, in which styles alternated every other day (see fig.2).

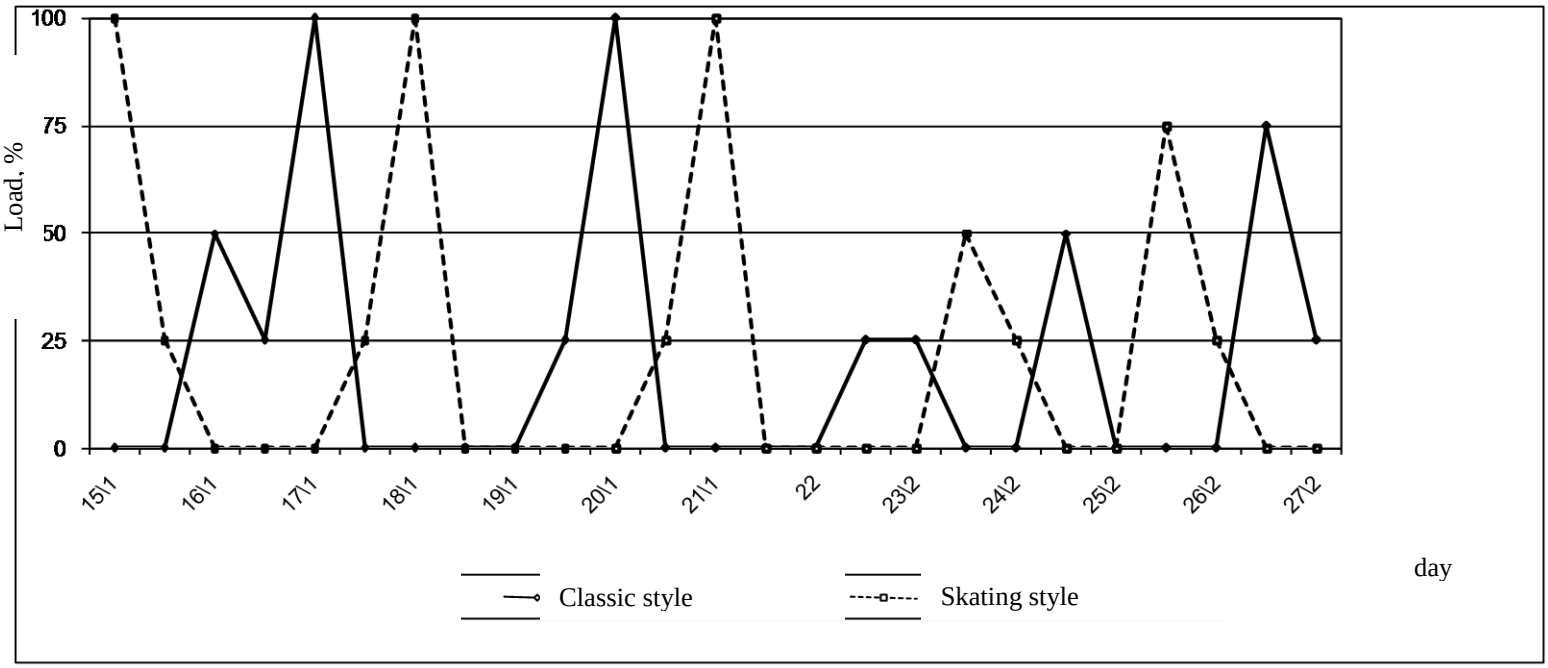

Fig.2. Combination of skiing styles at the stage of direct preparation for competition of 17-18 years old skiers (control group).

On the base of conducted pedagogical studies, we developed methodic of training process construction, which was used in experimental group. The given methodic stipulated the training of both styles in one training day. So, the first, main, classic style training envisaged development of special skiers' abilities, the second – was free style training, considering preparation for next day training. Next day, sequence of skiing styles changed (see fig.3).

Orientation of trainings, load's scope and intensity were similar in both groups.

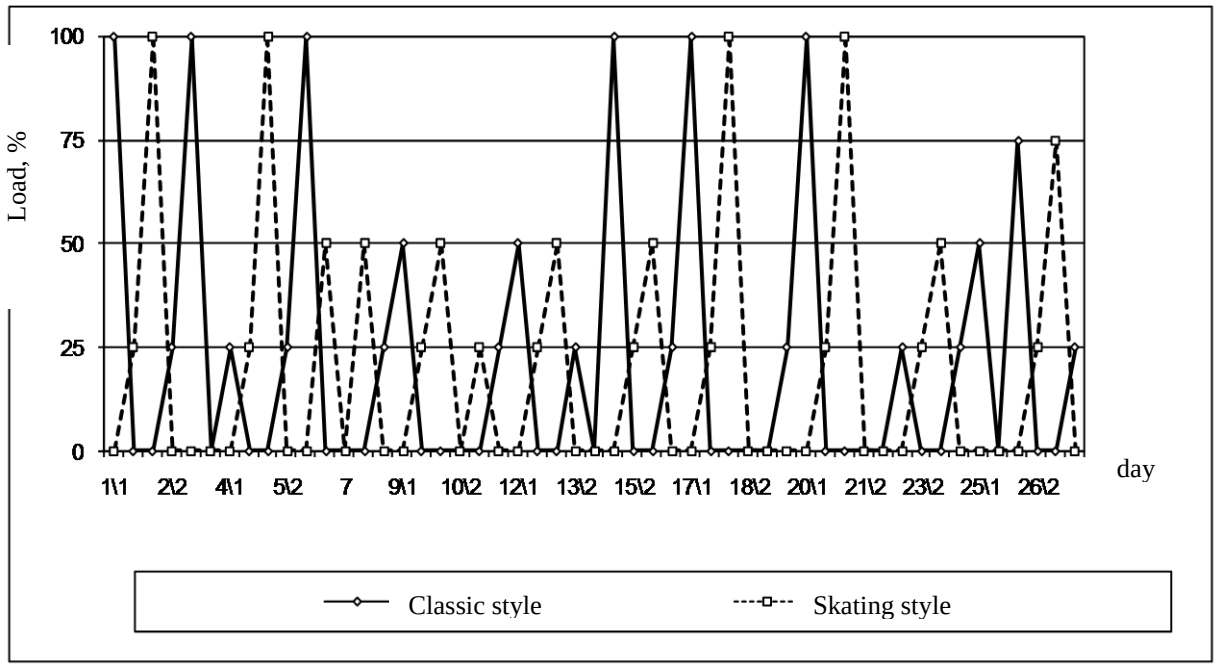

Fig.3. Combination of skiing styles at the stage of direct preparation for competition of 17-18 years old skiers (experimental group).

The carried out experiments showed that the applied methodic of pre-competition ski-racers' training from experimental group, significantly improves results of classic and skating styles' racings (see table 2).

E.g., classic style's results are better at experimental group by 42 sec. ($p<0,05$), while at the beginning of experiment there was no confident difference.

Like this, skating style's results of experimental group skiers were better and difference from control group results was 21 sec. ($p<0,05$).

Besides, time results of control group classic style skiers improved by 2,24% ($p<0,01$), and mean speed increased by 0,12 m.p.sec. However in comparison with initial indicators there was not found any confident difference ($p>0,05$). While, time results of experimental group improved by 4% ($p<0,01$), and mean speed increased by 0,2 m.p.sec. ($p<0,05$).

Table 2

Comparative characteristics of indicators of average speed and time results in control and experimental groups before and after experiment (n=10)

INDICATORS			Before experiment		After experiment		t	p
			$X_1 \pm m_1$	σ_1	$X_2 \pm m_2$	σ_2		
Classic style	Control group	Time result, sec.	2010± 6,39	20,20	1965± 3,98	12,58	5,98	<0,01
		Average speed m.p.sec	4,97± 0,05	0,15	5,09± 0,03	0,10	2,07	>0,05
	Experimental group	Time result, sec.	2003± 6,52	20,59	1923± 5,02	15,86	9,72	<0,01
		Average speed m.p.sec	5,00± 0,05	0,16	5,20± 0,04	0,14	3,13	<0,05
Ковзанярський стиль	Control group	Time result, sec.	1910± 5,26	16,62	1790± 5,18	16,38	16,3	<0,01
		Average speed m.p.sec	5,24± 0,05	0,15	5,59± 0,05	0,16	4,93	<0,05
	Experimental group	Time result, sec.	1915± 6,05	19,12	1769± 2,29	7,24	22,6	<0,01

		Average speed m.p.sec	5,23± 0,06	0,17	5,65± 0,02	0,07	6,67	<0,05

Owing to experiment, time result of skating style racing shortened by 6,28% ($p<0,01$), average speed increased by 0,35 m.p.sec., in control group and in experimental group by 7,62% ($p<0,01$) and 0,42 m.p.sec. ($p<0,05$).

The conducted parallel experiment showed that combination of skiing styles at trainings at the stage of direct preparation for competitions, influenced positively on preparedness oif both group skiers, in experimental group, with alternating of skiing styles at every training, results were better, that witness about effectiveness of developed by us methodic of pre-competition training.

The obtained results of the researches confirmed our assumption concerning advantages of method of styles' dividing and training loads for 17-18 years old ski racers at the stage of direct preparation for competition in different skiing styles.

We have found out that application of alternating styles in one training day by ski-racers positively influences on improvement of sports results both of classic style ski racings and of skating style ones.

Summary

1. Anthropometric testing of qualified ski-racers showed that difference of model characteristics of posture is within 2,2% - 7,6% and they are confidently different ($p<0,05$) by most of indicators.

2. The most significant model characteristics of 17-18 years old ski-racers' functional preparedness for classic style skiing are the following indicators: heart beats frequency in rest– 54 b.p.min, heart beats frequency after loads –– 178 beats per minute (b.p.min.), PWC_{170} – 105 conventional units (conv. un.), vital capacity of lungs (VCL) – 54 liters (l.), Rufiet-Dixon's test -22 conventional units (conv.un.), coefficient of endurance – 80 conventional units (conv.un.), Index of Harvard step-test (IHST) – 112 conventional units (conv.un.), frequency of breathing - 26,8 times per minute, Skybinskiy's index - 27,1 milliliters per kilogram (ml.p.kg.).

For skating style skiing the following indicators are optimal: heart beats frequency in rest– 52 b.p.min., heart beats frequency after loads– 186 beats per minute (b.p.min.), PWC_{170} – 107 conventional units (conv. un.), vital capacity of lungs (VCL) – 53,3 liters (l.), Rufiet-Dixon's test -25 conventional units (conv.un.), coefficient of endurance – 77 conventional units (conv.un.), Index of Harvard step-test (IHST) – 115 conventional units (conv.un.), frequency of breathing - 24,8 times per minute, Skybinskiy's index - 27,45 milliliters per kilogram (ml.p.kg.).

3. Application of methodic of pre-competition meso-cycle construction, which was based on combination of skiing styles within one training day, in which main and additional trainings were carried out in different styles, with their alternating the next day, is the most optimal and permits to achieve high sports results in ski racings of classic and skating styles.

4. The developed by us methodic of pre-competition preparation of 17-18 years old ski-racers permitted to increase sports results of classic style skiers by ($p<0,01$), and of skating style skiers – by 7,6% ($p<0,01$).

The methodic of pre-competition training of ski-racers with combination of different skiing styles can be used not only at the stage of direct preparation for competitions but also in other meso-cycles of annual macro-cycle.

Further researches can be oriented on searching of effective methods and means of ski-racers' training, considering individual morphological and functional features of sportsmen.

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