

I. ТЕОРІЯ І МЕТОДИКА ПІДГОТОВКИ СПОРТСМЕНІВ

PECULIARITIES OF LINKS BETWEEN SPORTS RESULTS AND AGE OF ELITE FEMALE SKIERS

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Анотация

В статье анализируются особенности взаимосвязи спортивных результатов и возраста у лыжниц-гонщиц высокой квалификации в олимпийском сезоне 2009–2010 г. На зимних олимпийских играх в Ванкувере в лыжных гонках среди женщин медали в индивидуальных гонках завоевали 7 лыжниц и их возраст $28,3 \pm 2,4$ года, а 1–10 места занимающих лыжниц (на все индивидуальные гонки) средний возраст $28,1 \pm 4,3$ года. В мире в лыжных гонках среди женщин позиции лидеров занимают лыжницы в возрасте 25–32 года, но очень талантливые лыжницы 21–23 года также достигают очень высоких спортивных результатов.

Abstract

The article deals with the peculiarities of links between female elite ski racers' sports results and their age in the Olympic season of 2009–2010. In the individual ski races in Vancouver Winter Olympic Games the medals were won by seven female skiers whose age was 28.3 ± 2.4 years, and the first decade (in all distances) included 28.1 ± 4.3 -year-old female skiers. In the world the best positions are taken by older 25–32-year-old female skiers, however, young talented 21–23-year-old skiers can achieve high results and win medals both in sprint and in long distances.

Keywords: female skiers, ski races, Winter Olympic Games, World Cup Skiing Championship, age.

Introduction

Managing elite athlete training is linked to predicting, individual model indices of athletic fitness, evaluation of the data of athletes' physical development and athletic fitness, and establishing optimal age limits for the achievement of the best sports results (1, 17, 18, 19). Rational planning of the training process is linked to the establishment of optimal age limits for the achievement of the best sports results (9, 13, 16, 18). In ski races high results are achieved by female skiers of different ages (7, 8, 20). In the training system of elite female skiers each stage of multiyear training is important because the efficiency of training and sports results depend on the rational planning of physical loads for different ages according to individual abilities of athletes (12, 13, 18, 21). Changes in female skiers' physical abilities and functional powers while training depend not only on training methods but also on the skiers' age (14, 16, 18, 21). In the formation of the national teams of skiers-racers for the Olympic cycles it is very important to evaluate the peculiarities of the links between sports results and age (9, 10, 11, 15, 20). According to V. Platonov (12), at the age of 25–28 years female skiers maximally realize their individual abilities and achieve their best sports results.

The age limits of female skiers who won medals in winter Olympic Games did not change much: in the Olympic Games of 1956 the age of female skiers – medal winners was from 26 to 30 years, in 1992 (Al-

bertville) and 1994 (Lillehammer) Winter Olympic Games it was from 24 to 28 years (20). In Nagano (1998) and Salt Lake City (2002) Olympic Games the Olympic medals were won by female skiers who were 28.40 ± 4.0 and 28.42 ± 4.81 years of age (7, 8). The percentage distribution of female skiers' age who won medals in the Salt Lake City (2002) Olympic Games was as follows: 21 years of age – 10.53%, 22 – 5.27%, 24–30 – 47.37%, and over 30 years – 36.84% (8). Only mature elite athletes can win in the high ranked competitions. Mature mastership is mostly conditioned by athletic fitness, years of sports activities and competitive experience. Competitive experience is conditioned by athletes' age (15, 18, 19). In the last few decades the duration of athletic career of elite female skiers has become longer (15). Older elite skiers (both men and women) participate less in the World Cup competitions, and they model their training process and competitive activities for the achievement of the best sports results in the world championships and the Olympic Games.

The problem of interaction of elite female athletes' sports results and their age has not received sufficient attention of researchers and still remains relevant.

The aim of the research was to establish the peculiarities of links between elite female skiers' sports results and their age in the Olympic season of 2009–2010.

Research methods

Research methods used in the study were literature review, analy-



Table 1.
Age indices ($x \pm SD$) of female skiers in 2010 Vancouver Winter Olympic Games

Distances	Taken place	Age (years)
In all distances	1–3	28.3±2.4
In all distances	1–10	28.1±4.3
Combined races 7,5 km C + 7,5 km F	1–3	28±1
	1–10	27.6±4.3
30 km C	1–3	29±2
	1–10	28.4±4.4
10 km F	1–3	27.7±5.1
	1–10	29.1±4.1
1,5 km C sprint	1–3	28.7±1.5
	1–10	27.4±4.5

Note. F – free style, C – classical style.

sis of documents, and comparative analysis. The data were obtained from the official databases of the International Skiing Federation (FIS): competition protocols of Winter Olympic Games (Vancouver), 2009–2010; final score reports of World Cup Skiing Championships, 2009–2010; competition protocols of the multi-day skiing competition «Tour de Ski» and bibliographical data about elite skiers' participation in competitions (Cross country, internet link: <http://www.fis-ski.com/cross-country>) (2, 3, 4, 5, 6). We

used the age indices of female skiers ($x \pm SD$) who took the 1st–3rd and 1st–10th places in different distances in winter Olympic Games, 1st–10th places in total in the World Cup championships before the beginning of the Olympic Games, 1st–10th places in the total and final score in the World Cup championships (the results from all stages in World Cup championships were totaled). We established correlations of the interactions between the female skiers' age indices and the taken places in total in the World Cup skiing cham-

pionships before the beginning of the Olympic Games. The data were processed using *Microsoft Excel 2003* and specialized statistical program *SPSS 12.0 for Windows*.

Results and discussion

The mean age of female skiers who took the 1st–3rd places in Winter Olympic Games in 2010 was from 27.7 ± 5.1 to 29 ± 2 years (Table 1). In the group of skiers who took the 1st–10th places the youngest skier was 21 years old and she took the 10th place, and the oldest skier was 33 years old taking the 45th place. In long distance races the youngest skier was 21-year-old T. Johaug from Norway, and she took the 6th place in the combined (duathlon) 7.5 km C + 7.5 km F races, and the 7th place in the 30 km C races. In the individual races the oldest medal winner was 32-year-old skier from Estonia K. Šmigun who won the silver medal in 10kmF races. The youngest one was 22-year-old skier from Sweden C. Kala who took the gold medal in 10kmF distance races.

Percentage distribution of female skiers who won medals in Vancouver Winter Olympic Games according to their age was as follows: 2–25 years of age – 28.6%; 26–29 years – 28.6%;

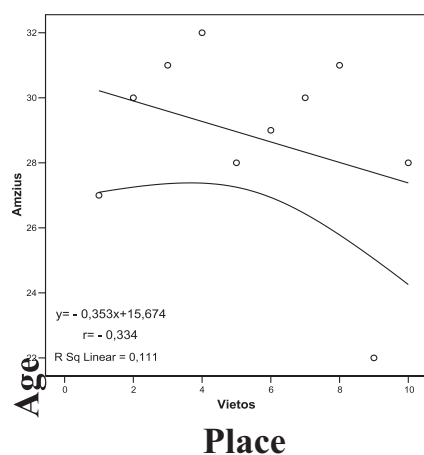


Figure 1. Correlation between age and taken places of skiers who took the 1st–10th places in the final total score in the World Cup Skiing Championship before the Olympic Games

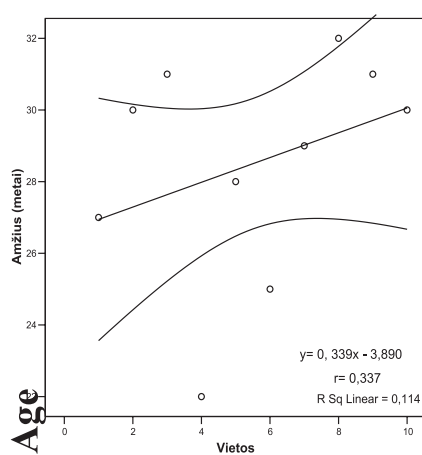


Figure 2. Correlation between age and taken places of skiers who took the 1st–10th places in long distances in the World Cup Skiing Championship before the Olympic Games

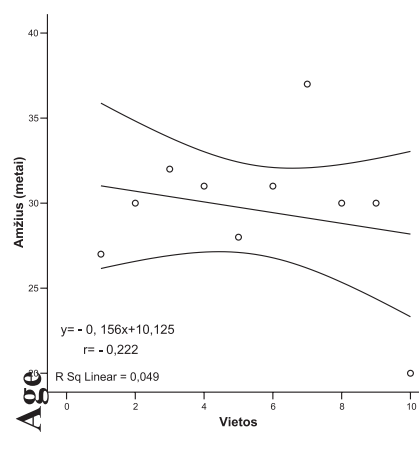


Figure 3. Correlation between age and taken places of skiers who took the 1st–10th places in the total score of Tour de Ski multi-day ski races



Table 2.
Age indices (years) of skiers who took the 1st–10th places in the individual events in Winter Olympic Games and those who took the 1st–10th places the final total score in the World Cup Skiing Championship before the Olympic Games

Initials (name, surname)	Age	Final score in the World Cup Skiing Championship			<i>Tour de Ski</i> 2009–2010
		Long distances and sprint	Long distances	Sprint	
		Place	Place	Place	
K. J.	27	1	1	2	1
M. P.	30	2	2	1	2
S. A.	31	3	3	3	4
F. A.	32	4	8	11	3
S. K.	28	5	5	48	5
B. M.	29	6	7	7	–
L. M.	30	7	10	18	8
R. R.	31	8	9	37	6
K. C.	22	9	4	68	–
K. N.	28	10	16	8	–
K. I.	25	11	6	–	–
S. O.	37	12	18	59	7
M. E.	33	13	13	–	11
H. A.	23	14	12	39	–
F. H.	20	15	–	4	–
I. I.	24	18	67	6	–
K. M.	20	20	25	41	10
G. M.	30	21	54	9	23
F. V.	24	22	92	5	–
S. V.	34	24	14	67	19
K. V.	33	26	17	26	–
Z. K.	30	27	26	–	9
P. A.	25	29	57	10	–
B. S.	21	30	40	12	–
S. E.	29	31	19	43	–
R. S.	33	32	33	35	16
M. S.	32	35	23	–	21
P. M.	21	39	37	22	35
Š. K.	32	41	20	81	–
L. K.	35	44	36	70	15
O. A.	33	48	43	33	–
I. M.	29	52	31	80	–
J. U.	23	53	42	47	–
R. K.	27	55	58	34	–
J. T.	21	63	44	64	–
$\bar{x} \pm SD$	28,1±4,7				

30–33 years – 42.9%. We analyzed the interaction of the skiers' age and sports results in free style skiing in Winter Olympic Games. In the total score of the World Cup Skiing Championships the first were 28–31-year-old skiers (Table 2). The correlation ($r = -0.334$) between the taken places in the total credit (long distances and sprint) in the World Cup Skiing Championships before the Olympic Games and the age indices of skiers who took the 1st–10th places confirm that older skiers took higher places (Figure 1). Correlation ($r = -0.337$) between the taken places in the total score (long distances and sprint) in the World Cup Skiing Championships before the Olympic Games and the age indices of skiers who took the 1st–10th places show that younger skiers produce higher results before the beginning of the Olympic Games (Figure 2).

In the final score of the *Tour de Ski* competitions the prize places were taken by older more experienced female skiers, and the first decade included only two younger skiers (Figure 3, Table 2). The mean age of skiers who took the 1st–10th places in Vancouver Winter Olympic Games in different distances and in the World Cup Skiing Championship in different credits was 28.1 ± 4.7 years (Table 2).

In the group of skiers who took the 1st–10th places in the World Cup Skiing Championship and in the individual events in Vancouver Winter Olympic Games, eight skiers were up to 23 years of age and they were strong rivals to older more experienced skiers.

Research results confirmed that older and more experienced female skiers dominate among the world elite skiers-races (7, 8, 15, 20). On the basis of our findings we claim that talented 21–23-year-old skiers can achieve extremely high sports results and take medals in the Olympic Games and world championships. 30–33-year-old skiers can produce good sports results and win medals in high ranked competitions. Thus, pre-



paring elite skiers of different age for high ranked competitions the training programs should be individualized according to the skiers' abilities and their age (9, 15, 16).

Research results let us suppose that in the ski races the best positions are taken by older 25–32-year-old female skiers, however, young talented 21–23-year-old skiers can achieve high results and win medals both in sprint and in long distances.

Conclusion

In the individual ski races in Vancouver Winter Olympic Games the medals were won by seven female skiers whose age was 28.3 ± 2.4 years, and the first decade (in all distances) included 28.1 ± 4.3 -year-old female skiers.

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