DEVELOPMENT OF BALANCE IN YOUNG KAYAKERS IN THE INITIAL STAGE OF TRAINING

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ABSTRACT

The article discusses the issues of accelerated formation and development of specific (water) balance using special means and methods.

Keywords. Sprint kayak, balance, balance training, beginners, kayak balance training ergometer.

INTRODUCTION

Kayaking is a paddle sport that requires a good sitting balance and involves high metabolic demands and challenges related to the balance control system [2, 9]. Paddle sports have two sub-disciplines: canoeing (C) and kayaking (K). Kayaking requires a comprehensive balance and stability training since maintaining a seated position requires a continuous balancing of the irregular sways in the upper part of the body [9] and due to the narrow designs of the flat-water kayaks [10]. In conventional canoeing/kayaking training, 'winter training session' lasts from October to March and consists of three parts, each covering a period of two months. In the first part, aerobic capacity should be increased; the second part should include balance-oriented exercises; and the third part involves the preparations for outdoor training [11]. It may be convenient to board the canoe/kayak on land; boarding in water requires good balance skills at the beginning. A wrong move or loss of balance can lead to going overboard or hitting the ground. The same is also possible while getting off a canoe/kayak. Having good balance skills is a significant advantage in such situations. It is particularly more difficult for two people to carry out a task synchronously in a two-person canoe/kayak (K2- C2). And so, the role of balance training, the difficulties that may be faced, and possible solutions have been studied through interviews with canoers/kayakers and their coaches to conclude that balance skills are of great importance in canoeing/kayaking. It has been observed that due to the balance problems they have experienced, many of the candidate athletes who started training for this sport and put a great deal of effort during winter technical training off the water were unable to overcome their fear of falling once they boarded the kayak on water. Thus, all of the efforts put in during the season end in vain, resulting in the demise of athletes. Therefore, the aim of this study was to determine the effects of kayak specific balance training exercises added to beginner athletes' usual winter training program on their general and kayak-specific balance performances in order to prevent the waste of their time, effort, and resources.

The huge competition on international scene in rowing demands indefatigable and constant search of new, effective agents, receptions, approaches and methods of work with beginning young oarsmen. Thus, it is necessary to notice, that to a scientific substantiation of training process as at adults «masters of an oar» rowing, and at juvenile sportsmen, the insufficient attention is paid.

In the scientifically methodical literature of research are spent on oarsmen the small number is

already confident owning balance and a technics hoe-type movements, and works devoted to formation, development and the accelerated development of balance, technics of rowing and mastering by control by a boat very much. Many known scientists on rowing say, that with technics mastering rowed also development by balance it is necessary to reduce on a land. But how to train, where to train and what methods to use? On these questions scientists do not give the answer. To solve this problem, we developed a simulator for the development of balance in young rowers. The created innovative simulator "Kayak balance training ergometr" actively stimulates the training process in the preparatory period and allows you to maximally bring the technical preparation of rowing with the formation of water balance on land to the realities of coordination in a boat on the water.

Purpose: Determining the effectiveness of special tools and methods for developing balance stability for rowers in initial training.

Key Points

• Regular participation in balance training practices can improve balance control more efficiently in young athletes who are new to kayaking.

• Special balance training practices significantly improve the kayak-specific balance for beginners and facilitate learning the sport.

• Combining special balance training with the traditional kayak training method increases the overall effect of the training due to the interaction between the two.

Materials and methods

Subjects

The study included 40 healthy male subjects who were between the ages of 12 and 13, had no health problems, had no vestibular disorders. The group was randomly divided into two groups: intervention and control, which were comparable in terms of their physical characteristics ($p>0.05$)

Experimental Design

Since bad weather conditions increase the risk of kayak capsize, the study plan was prepared so as to start training in May when the weather and water temperatures begin to improve. In the context of study, pre/postintervention static balance (Romberg test) measurements were done in the laboratory. The kayak-specific dynamic balance measurements on standard racing kayak (K1) using a device "Kayak balance control" were performed after the intervention only since the subjects were new to kayaking.

The intervention and control groups began their training program one week after the pre-intervention measurements. The postintervention measurements were done one week after the end of the training program.

Training Program for Control Group: The control group worked with the training program known as "Traditional Training System": 3-day general endurance and strength training and 2-day technical kayak training per week for 8 weeks and kayak training on water at the end of one month.

Training Program for Intervention Group: Balance training were given as 30-min-long exercise programs 3 days a week on uneven surfaces, with special balance tools, and with specially designed kayak balance training ergometr. A "Balance Training Exercise Plan" was prepared for each week; each session included 10- min warm-up and ten special balance exercises containing proprioceptive exercises (3 min each) performed in static and dynamic positions for a total of 30 minutes. The kayak-specific dynamic balance training was performed

on a kayak balance training ergometr that was judged by coaches to adequately mimic the kayak sway and where fall and balance loss can be observed.

In the Balance Training Exercise Plan, special attention was paid to arranging the activities from simple to complex where static exercises were followed by the dynamic exercises, increasing the tempo to the appropriate speed gradually, performing the initial training on a stable surface (flat ground) followed by training under different conditions (on moving, soft, and slippery ground) and with external stimuli and balance training equipment (bouncing ball, balance ball, kayak balance training ergometr, etc.). A 30-second rest period was given after each exercise.

The training program for the intervention group.

Exercise Plan	**Content**	**Equipment**
Initial Phase (month 1-2)	Warm-up, static balance exercises with eyes open/shut, glider and flamingo postures, stretching exercises	Balance pad, Balance board, Bosu ball, Balance board, Wobble board, Pilates ball, Balance pads, Kayak balance training ergometr
Middle Phase (month 3-4)	Warm-up, static-dynamic balance exercises with eyes open/shut, Y balance exercise, posture exercises on balance pads, stretching exercises	Balance pad, Balance board, Bosu ball, Balance board, Wobble board, Pilates ball, Balance pads, Kayak balance training ergometr
Advanced Phase (month 5-6)	Warm-up, dynamic balance exercises on fixed and moving surfaces, dynamic balance exercises with balance equipment, special balance exercises on kayak prototype, stretching exercises	Balance pad, Balance board, Bosu ball, Balance board, Wobble board, Pilates ball, Balance pads, Kayak balance training ergometr

Results

This study aimed to analyze the effects of a special balance-training exercises and multifunctional kayak balance training ergometr on the static, dynamic, and kayak-specific balance values of male candidate athletes who are new to kayaking. The results supported the original hypothesis that regular participation in balance training exercises improves the balance control in young kayakers who are new to kayaking and facilitates learning the sport and that combining special balance training with the traditional kayak training increases the overall effect of the training.

When comparing the results of a preliminary study evaluating the ability to maintain equilibrium, there are no significant differences between the control and Intervention groups, $P \geq 0.05$.

Statistical indicators	Intervention group				Control group			
	(open eyes)before	(open eyes) after	(closed eyes)before	(closed eyes) after	(open eyes)before	(open eyes) after	(closed eyes)before	(closed eyes) after
M	39,3	47,5	23,3	27,5	38,3	37,3	22,6	22,5
±δ	8,5	6,4	5,7	7,4	8,5	6,8	5,5	3,7
Statistical Inference	P≤0,05		P≤0,05		P≥0,05		P≥0,05	

Conducting testing with closed eyes made it possible to obtain more objective information about the state of the ability to maintain balance. Regulation of balance and control of the posture is carried out due to muscle feeling (proprioceptive sensitivity), and not due to the visual analyzer. When assessing the ability to balance between the results in the Intervention group obtained in tests before and after the study, there are significant differences that are characterized by positive dynamics in increasing the level of manifestation of the ability to balance in kayakers. P≤0,05

In order to monitor the dynamics of the development of the balance of rowers at the initial stages of preparation using a special electronic device “Kayak Balance Control” (KBC), we recorded the roll angles of the boat at the rowers of the control and intervention groups during the experiment. This allowed us to compare the stability indicators of the balance of rowers in the control and intervention groups.

Testing was carried out for six months at the end of each month during the experimental period. In all control tests obtained during the study, the indicators in the experimental group were higher than in the control group. [p <0.05]

CONCLUSIONS

The rational use of the created rowing training with the use of special exercises for balance gives an opportunity to solve purposefully and rationally the questions of educational-training process management and helps to teach the rowing movements technique more effectively and provides formation of a specific water balance, actively motivates the process of getting knowledge; to observe the principle of complementarity, i.e. correspondence of special exercises to the main competitive movements, owing to which not only physical qualities, but also technical mastery are developed; helps to broaden the range of means and methods, used in physical, technical, tactical, moral-volitional and theoretical training of sportsmen.

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