THE EFFECTS OF ALPINE SKIING TRAINING ON THE ADOPTION OF SKIING ELEMENTS IN GIRLS

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original scientific paper

ABSTRACT: Alpine skiing is a motoric and energy complexed and demanding sport activity. Alpine skiing requires a long systematic preparation, but there are still dilemmas in choosing the most optimal ski learning model. The aim of this research is to determine the effects of successful performance implementation of basic and advanced elements of alpine skiing, conditioned by the attained five-day ski education for school-age boys. It is assumed that the treated program will produce statistically significant differences in favor of the final measurement. METHODS: The study was conducted on a sample of 33 girls aged 7-10 years residing in Sarajevo Canton. Seven variables were used to evaluate the performance of the basic ski elements: STARN- straight run, TRSNG – traversing, UPTRN – uphill turn, SNPGH – the snowplough, SNPGT- snowplough turns, SNPGC – snowplough curve, SLSID – sliding sideways. Two variables were used to evaluate the advanced ski elements: STTUR – stem turns and SHPLT – short parallel turns. The overall performance of the Alpine ski elements was evaluated by a panel of judges (three judges). The research hypothesis was measured using the t-test for dependent samples. RESULTS: The results showed significant statistical differences in all nine treated variables. The five-day ski training program has produced a positive transfer to the adoption of basic and advanced ski elements CONCLUSION: The five-day ski training program, with its contents, workloads, organization and methodical procedures, significantly influenced the adoption of basic and advanced ski elements. The five-day training showed positive effects on the adoption of skiing elements in elementary school.

Keywords*:* Measurement, biomechanics, turns, beginners, , judges, mistakes.

INTRODUCTION

Skiing as a physical activity originated primarily as a means of survival. Speed and mobility were of special importance for the members of the first communities. According to an old Norwegian legend, the roots of skiing go as far back as 8000 years before Christ.Alpine skiing is a motorically and energetically complex and demanding sports activity. By analyzing alpine skiing through the criteria of structural complexity, it falls in the group of monostructural sports in which there is one or more closed movement structures of an acyclic character which are successively repeated. (Milanović, 1997). Alpine skiing is a complex sport that demands good physical and mental preparation from an athlete in its structure and realization. Skiing is a sport that is performed with specific equipment and as such it started developing on steep slopes of the Alps, and that period is marked as the beginning of the development of the alpine skiing technique. Alpine skiing requires a long and systematic preparation, however, there are still dilemmas when it comes to choosing the most optimal model to learn how to ski. All motoric knowledge is prone to certain changes. MalackoiRađo (2004) emphasize that the changes in the subject's state primarily depend on the process of receiving, flow, and retention of information transfer. Learning how to ski represents a challenge for children. Learning how to ski starts with games in the snow, and then by setting simple movement tasks on skis, and later by upgrading through basic skiing elements with a tendency of adopting advanced skiing techniques. Properly selected tasks, exercises, knowing the basic natural tendencies of a child's development, and the basic rules of learning how to ski prevent improper adoption of movement stereotypes (Jelka, 2009). Skiing as a sports activity requires and puts great emphasis on proper posture and as such requires special motoric capabilities. The motoric capabilities the level of which significantly affects the level of technical proficiency in any sport, skiing included, are often neglected or less developed in children. This is why there is more and more emphasis on the need of society for caring about physical activity in youth through which the development of motoric capabilities will be impacted (Cleland et. al., 2008). When we talk about motoric or movement development, alpine skiing as a sports activity has a huge significant effect on the improvement of all motoric capabilities. Motoric or movement development has several characteristics which define it, so many authors characterize it according to three characteristics:„Skender et. al. (2010) 1) that it is a continuous process of changes in a functional capacity. Just like all living organisms, humans are constantly developing but the scope of the changes can vary in different life stages; 2) that it is connected with age, but not dependent on it. Individuals don't necessarily have to make the same amount of progress in chronological and physiological development; 3) that the development is a sequential occurrence. One step leads to another and that is an irreversible occurrence. The aim of this research is to determine the effects of successfulness of performing basic and advanced elements of alpine skiing, conditioned by a realized five-day skiing education for school-age boys. It is assumed that the treated program will produce

statistically significant differences in favor of the final measurement.

METHODS

Sample of subjects

This research was carried out in the Sarajevo Canton on the sample of 33 elementary school-aged female subjects who are beginner skiers. The subjects are clinically healthy without notable morphological and locomotive defects.

Sample of variables

The choice of variables for this research was performed on the basis of appropriateness and adaptability to the age of the subjects.

Variables for estimating the success level at performing basic skiing elements

The variables for estimating the success level at performing basic skiing elements in this research were defined by the curriculum of the basic school of alpine skiing. The practical part of the skiing school's program consists of training basic skiing elements. The variables for estimating the success level at performing basic skiing elements in this research are made up of nine basic skiing elements. In order to simplify the processing of results, the variables for estimating the success level at performing basic skiing elements are coded so that five letters denote one element of alpine skiing. The variables for estimating the success level at performing basic skiing elements in this research are as

follows: Test – STARN, straight run; Test – TRSNG, traversing; Test – UPTRN, uphill turn; Test – SNPGH, the snowplough; Test – SNPG, snowplough turns; Test – SNPGC, snowplough curve; Test – SLSID, sliding sideways; Test – STTUR, stem turns; Test – SHPLT, short parallel turns.

The program and procedure of grading the success at performing basic skiing elements

Realized program

The complete examination was performed between 8 AM and 12 PM. The location of the test (Bjelašnica) was equipped with all the necessary testing equipment. The training was realized in the winter season period and it lasted for 6 hours a day for 5 working days, for a total of 30 hours of training. The training was performed by a licensed skiing instructor. Determining the success levels of individuals at performing certain sports activities is impossible to do with objective measuring instruments, so determining the success levels of performing certain sports activities must necessarily be performed with a subjective estimate of competent judges.

Statistical processing of results

A database has been formed by statistically processing the results, and then the data was put in order, grouped, and put in tables. Its mathematical processing was realized with the use of Microsoft Excel and a statistical application software SPSS 10. Grading the success at performing basic skiing elements was performed by five judges, all of which had to fulfill the following criteria:

- *that they have graduated from the Faculty of sport and physical education*
- *that they possess the theoretical and practical knowledge of alpine skiing*
- *that they possess a skiing instructor license*

The knowledge of the subjects at performing basic skiing elements was defined with a scale of five grades. The grading was performed exclusively with full grades ranging from 1 to 5. Each element was performed two times (one after another because of a possible mistake during the first attempt), and the judges took the better attempt into consideration. Each judge wrote down grades ranging from 1 to 5. After the judges announced their grades, a secretary wrote the said grades in each subject's file.

The received grade is a result of technical performance of a certain element i.e. a grade of the biomechanical correctness of the element, awarded on the basis of subjective estimate by the judges. Potential technical mistakes during performing the basic skiing elements are manifested through deviations in the position of the body or the parts of the body during the performance. The judges have synchronized their criteria and paid special attention to: the starting position, the position of the body, the position of the legs, the position of the arms, aesthetic performance of the exercise, coordination of the exercise, technical performance of the exercise, the amplitude of movements, the speed and the rhythm, and the final position.

Tabela 1. Evaluation criterion (Kazazović, 2003)

EVALUATION CRITERION	
Rating 5 (Five)	The element was optimally designed so that there were no errors in the starting position, body position, foot position, arm position, aesthetic performance of the exercise, technical performance, amplitude of movement, speed and rhythm, and end position.
Rating 4 (Four)	The element is optimally designed with slight errors in the specific technical requirements of starting position, body position, leg position, arm position, aesthetic performance of exercise, amplitude of movement, speed and rhythm and end position. Maximum number of minor errors 1-3.
Rating 3 (three)	The element is still well executed with a small number of errors for some of the technical requirements of starting position, body position, leg position, arm position, aesthetic execution of exercise, coordination of movement, amplitude of movement, speed and rhythm and end position, but overall the structure of movement is not disturbed . Maximum number of minor errors 2-4.

Rating 2 (Two)	Element runtime violated. There are errors with almost all of the above technical requirements. The structure of the movement was also disturbed.
Rating 1 (One)	The element is poorly executed with many errors. There are major drawbacks to all of the above technical requirements. The movement structure is significantly impaired.

Table 2. The differences between the initial and the final testing evaluation of skiing knowledge

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Dev.	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	STARN1 - STARN2	-1.738	.912	.141	-2.022	-1.454	-12.348	41	**.000**
Pair 2	TRSNG1 - TRSNG2	-1.762	.906	.140	-2.044	-1.480	-12.610	41	**.000**
Pair 3	UPTRN1 - UPTRN2	-1.571	.859	.133	-1.839	-1.304	-11.849	41	**.000**
Pair 4	SNPGH1 - SNPGH2	-1.905	.790	.122	-2.151	-1.658	-15.616	41	**.000**
Pair 5	SNPGT1 - SNPGT2	-1.881	.803	.124	-2.131	-1.631	-15.190	41	**.000**
Pair 6	SNPGC1 - SNPGC2	-1.762	.958	.148	-2.060	-1.463	-11.921	41	**.000**
Pair 7	SLSID1 - SLSID2	-1.071	.745	.115	-1.304	-.839	-9.314	41	**.000**
Pair 8	STTUR1 - STTUR2	-1.190	.804	.124	-1.441	-.940	-9.601	41	**.000**
Pair 9	SHPLT1 - SHPLT2	-1.214	.842	.130	-1.477	-.952	-9.346	41	**.000**
Pair 10	TOGR1 - TOGR2	-14.167	6.544	1.010	-16.206	-12.127	-14.030	41	**.000**

THE RESULTS

Based on the results presented in table 2, it is visible that there are statistically significant differences in all nine treated variables for the evaluation of basic and advanced skiing elements (Sig.=.000). The treated five-day program of skiing training with all of its contents, loads, and methodical procedures has produced a positive transfer on the adoption of basic and advanced skiing elements. The basic skiing techniques STARN, TRSNG, UPTRN, and SLSID represent the base elements with the skis arranged parallel to each other, while the SNPGH, SNPGT, and SNPGC elements are performed with the skis arranged in a wedge.

DISCUSSION

Cigrovski (2007) emphasizes that the most efficient way to teach basic alpine skiing techniques is the one which makes use of the elements of the snowplough alpine skiing technique in the program. With a properly learned straightforward snowplough, the dynamic balance with equal thrust on both skis is ensured as it is a beneficial body and ski position which forms the base of progression toward adopting more advanced skiing techniques. In order to properly master the snowplough turn, it is necessary to achieve a safe and somewhat automated performance of the straightforward snowplough and its variations (**Jurković, N., i D., 2003).** Potential technical mistakes during the performance of such alpine skiing elements are manifested through deviations in the position of the body and parts of the body during the performance. In order to efficiently master the snowplough turn element it is necessary to learn to transfer the weight of the body to the ski. Matkovićet. al. (2004) emphasize that chaining together several snowplough turns enables the skier to overcome the slope safely and in a controlled manner with a change in the direction of the movement. The stem turn, the parallel turn, and short parallel turns are skiing technique elements in which the skier continuously chains together multiple turns, so the leg muscles are significantly more engaged when

performing those elements in comparison to the straight run and the uphill turn, which are performed only to the left or the right side (**Cigrovski et. al. 2012**). This skiing element is also the most advanced technique which the subjects have presented during testing. **Murovec (2006)** emphasizes that the process of teaching beginners requires changing the length of the skis every couple of days. In the beginning, it is the most optimal to use shorter skis. The value of the sum of grades from the initial and the final test are evidently different, thereby confirming the existence of a statistically significant positive difference between the values of the total grades in favor of the final testing ($p<.01$). It should be noted that the subjects were absolute beginners, so progress was expected.

CONCLUSION

The aim of this research was to determine the effects of successfulness in performing basic and advanced alpine skiing elements, conditioned by a realized five-day skiing training for elementary school-aged girls. Student's t-test for dependent samples was applied for checking the effects of the tested skiing program, on the basis of which we tried to determine statistically significant differences after the realization of the skiing program. It is possible to realize positive effects on the adoption of basic and advanced skiing elements in girls aged 7-10 with a five-day skiing education ($p<.01$). We can conclude that the treated skiing program with its contents, loads, organization, and methodical procedures has produced a positive transfer on the adoption of basic and advanced skiing elements. The tested variables STTUR and SHPLT represent results of the advanced alpine skiing techniques which, for the first variable (STTUR), encompass parallel and snowhplough skiing with a rhythmic up-down movement and a synchronized change in ski position geometry during the given element. The second variable (SHPLT) represents basic short parallel turns in alpine skiing which is performed on skis arranged in a parallel fashion with pronounced vertical and rhythmic movement. This skiing element is also the most advanced technique which the subjects have presented during testing.

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