

Comparison of Some Motoric Characteristics of 11-13 Years Old Sedentary and Alpine Ski Athletes

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Article History:

Received: 10 September 2021

Accepted: 1 October 2021

Published: 1 October 2021

Keywords:

Ski; Alpine Discipline;
Physical Properties; Motorical
Specificities.

Abstract

The aim of this study is to compare the physical and motoric characteristics of two groups selected from 11-13 age group alpine skiers and sedentary children. A total of 140 children, 70 (35 boys-35 girls) athletes and 70 (35 boys-35 girls) sedentary, engaged in the ski branch in the province of Kayseri, participated in the study. Some tests selected from the Euro-fit test battery were applied to the children participating in the study. SPSS statistic package program was used in the evaluation of data. Independent samples t test was used to compare the data between male athletes and sedentary men, female athletes, and sedentary girls. Statistical significance level was taken as $p < 0.05$. According to the findings of some tests selected from the Euro-fit test battery of male athletes and sedentary children, there were no statistically significant differences in the right hand grip strength test, while statistically significant differences were found in the findings of other motoric tests. According to the findings of some tests selected from the same Euro-fit test battery, no statistically significant differences were found in the sit-and-reach and reach flexibility test of female athletes and sedentary children, while statistically significant differences were found in the findings of other motoric tests. As a result, as a result of the extra land training included in the training programs of boys and girls in alpine skiing in their developmental age, and when these training programs combine with the characteristics of alpine skiing, the development of the muscular system, skeletal bone system and motoric features of the athletes. It is thought to contribute.

How To Cite:

Yılmaz, E., Özdiç, M., Kumartaşlı, M., & Sazak, M. (2021). Comparison of Some Motoric Characteristics of 11-13 Years Old Sedentary and Alpine Ski Athletes. *Indonesian Journal of Sport Management*, 1(2), 138-151. <https://doi.org/10.31949/ijsm.v1i2.1480>

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INTRODUCTION

In recent years, sports have been practiced by large masses with the aim of getting away from stress, correcting their body composition, increasing their quality of life and making use of their free time. Nowadays, skiing, which is among the popular sports, is also highly preferred. Skiing is now one of the sports branches that appeal to large masses of people (Kumartaşlı et al., 2019). Besides being preferred as a popular sport, skiing also has great importance as a competition sport (Taş et al., 2008). With the increase in its popularity, it is also a popular and preferred sport among children.

In addition to physical and motor development in children, sport is a very important social factor. Due to sports, children's interaction with their environment increases, they become social, their communication skills develop, they gain self-confidence, and they play an important role in gaining acceptance in society. Psychologically, it shows positive developments in many aspects such as focusing ability, self-control, and decision-making ability (Sevim, 2002). In sedentary children, it causes many chronic diseases, especially obesity, to appear at an early age (Çetinkaya & İmamoğlu, 2018b).

Physical and physiological tests applied to children are important criteria for deciding which sports branch they are prone to by determining their body composition, growth rate and age. It should be known what skills children have, and they should be directed to sports branches that are physically and physiologically appropriate (Can and Polat, 2004).

Skiing is a sport branch that physiologically requires aerobic power for moderate to high level performances and anaerobic power for high level performances. In terms of motor features, skiing requires versatile features such as speed, flexibility, balance, quickness, and coordination (Andrea et al., 1993).

In addition, skiing requires fast, irregular, variable, short-term, high-intensity efforts made in cold weather conditions (Turnbull et al., 2019). Technical and tactical studies (Türkay, 2019) are necessary for the success of the child in the ski branch, and ski education and training should be given to children at a young age. There is a relationship between children's physical characteristics and their technical and tactical well-being. Alpine skiing also requires versatile features, and the high level of technical, tactical and biomotoric features in this branch greatly affects the performance. Studies on the physical and conditional characteristics of skiers in the world and in our country are very limited. In studies on the subject, it has been explained that physical competence and muscle strength are needed for athletes who do alpine skiing (Neumayr et al., 2003).

In alpine skiing, a high level of balance is needed according to the condition of the ground, the type of race, the slope and the muscle strength of the athlete. Because when the ground where the competitions are held is covered with ice, while the descents from the hill continue rhythmically and fluently, high speeds are reached on 2 mm ski steels and the athlete's displacement from one side to the other is expressed in milliseconds, so the ability to balance must be at a high level (İlçin et al., 2017).

In alpine skiing, the endurance characteristics of the athletes are of great importance in terms of performance in the slalom where the distance between the doors is short and the downhill races where the distance between the doors is the

highest. Quick turns during competitions, speed and agility, jumps, flexibility and balance while descending and ascending between slaloms are the determining factors in the race performance of the athletes. Developing hand grip strength while holding poles can provide an advantage to the athlete. These factors, which directly affect competition performance, should be studied and developed, especially starting from an early age (Güneş et al., 2019).

In the current direction, the aim of this study is to compare the physical and motoric characteristics of two groups selected from 11-13 age group alpine skiing athletes and sedentary children.

METHOD

Research Group

A total of 140 children, 35 boys (age 12.09 ± 0.81 , height 143.51 ± 8.43 , body weight 41.51 ± 8.98 , BMI 19.93 ± 2.87) and 35 girls (age 12.11 ± 0.79 , height 155.49 ± 6.33 , body weight 47.11 ± 5.01 , BMI 19.43 ± 1.04) 70 sedentary in total, with a total of 70 athletes, 35 boys (age 11.91 ± 0.81 , height 147.43 ± 10.75 , body weight 39.06 ± 10.46 , BMI 17.78 ± 3.64) and 35 girls (age 11.89 ± 0.75 , height 154.14 ± 5.93 , body weight 43.71 ± 5.64 , BMI 18.32 ± 1.34), who did alpine skiing between 1-3 years in Kayseri participated in the study voluntarily. Some tests selected from the Euro-fit test battery were performed on the children participating in the study.

Data Collection Methods

Euro-fit Test Battery

In line with the decision no. R (87) 9 of the Committee of Ministers of the Council of Europe of 19 May 1987, it was decided to use the 'European Physical Fitness Tests' to determine and evaluate the physical fitness of children aged eight and sixteen (EUROFIT, 1998). It has been suggested to the member states, including Turkey, to take measures regarding this practice. Uzunçan (1991) stated that the Eurofit tests applied since 1987 were developed for 3 main purposes. If we list these purposes;

1. It is aimed to develop physical education, which is one of the in-school sports activities of children, with the Euro-fit test battery and to perform it in a controlled manner, in the development of physical health and personal ability.
2. It is aimed to ensure that children gain confidence by protecting their bodies.
3. Euro-fit tests are intended to be used as an educational tool.

Euro-fit test battery; height, balance test with body weight measurement, weight ball throwing, vertical jump test, sit and reach test, sit-up test, 20 m. speed, touching the discs and 20 m. consists of reach (endurance) tests (Erikoğlu et al., 2009). In our study, some of these Euro-fit test battery measurements (Age, Height, Weight Measurement, Flamingo Balance Test, Sit-Reach Reach Flexibility Test, Standing Two-Legged Long Jump, Grip Strength Test, 20m Sprint) were applied to the children.

Euro Fit Test Battery Physical Measurements

Age: The ages of the children were determined by looking at the birth dates on the Turkish Republic Identity Documents. The ages of all children participating in the study are between 11-13 years old.

Height Measurement: In this measurement, measurements were made in cm. with the height scale of 0,001 precision, the feet of the children close to each other, the head straight and the eyes facing forward.

Weight Measurement: Measurements were made with a digital scale measuring with 100 gr. precision, with the children without shoes and wearing light clothes that would not affect the weight measurement. Care was taken to ensure that the child who climbed the scales for measurement was immobile and did not receive support from anywhere. Measurements were recorded in kg.

Some Motoric Tests from the Euro Fit Test Battery

Flamingo Balance Test: Measurements were made on the flamingo balance test platform. During this measurement, the children were asked to balance on the platform using their dominant feet. As soon as they regained their balance, their 1-minute period was started. Every fall from the platform and situations such as touching the other foot to the ground to provide balance were recorded as error points.

Sit and Reach Flexibility Test: After the children sat on the flexibility table and rested their feet on the lower part, they tried to move the bar on the table forward by reaching forward and without bending their knees, and the last point they could reach was recorded as cm.

Standing Long Jump with Two Legs Forward: Children were asked to stand with their toes behind the line and their feet shoulder-width apart. The children were asked to jump forward as far as they could jump, in a position parallel to the floor, with the arms in front of the body, with the knees slightly bent, with the swinging movement of the arms. The distance from the heel closer to the line was recorded as cm. after both feet landed simultaneously with the jump. The test was administered twice, and the best jump was recorded.

Hand Grip Strength Test: Measurements were taken using a Holtain brand hand dynamometer. The children were asked to hold the dynamometer first with their right hand and then with their left hand and squeeze it with all their strength so that the arm-body angle was approximately 30 degrees. The test was applied twice. The highest grade was recorded in kg.

20m Sprint: Measurements were made using a photocell. When the child is ready, he is asked to exit the photocell without giving a command, and he is asked to run forward at maximum speed and pass quickly through the arrival photocell 20 m ahead. The test was administered twice, and the highest grade was recorded. After the arrival photocell, protective measures (cushion, soft material, etc.) were taken to protect the health and safety of the child. Measurement results are recorded in seconds.

Analysis of Data

SPSS statistical package program was used to evaluate the data. The Independent Samples t-Test was used to compare the data between athletes and sedentary boys and girls participating in the study. The statistical significance level was taken as $p < 0.05$.

FINDINGS

Table 1. Demographic information of male athletes and sedentary children participating in the study

Variables	Group	N	X±SD	Min.	Max.
Age (Year)	Athlete	35	11,91±,81	11	13
	Sedentary	35	12,09±,81	11	13
Height (cm)	Athlete	35	147,43±10,75	127	168
	Sedentary	35	143,51±8,43	129	158
Body weight (kg)	Athlete	35	39,06±10,46	23	55
	Sedentary	35	41,51±8,98	25	55
BMI (kg/m2)	Athlete	35	17,78±3,64	12,62	25,33
	Sedentary	35	19,93±2,87	14,92	24,84

When Table 1 is examined, the age of male athletes is 11.91±.81, their height is 147.43±10.75, their body weight is 39.06±10.46, BMI is 17.78±3.64, and the age of sedentary boys is 12.09±.81, height 143.51±8.43, body weight 41.51±8.98, BMI 19.93±2.87.

Table 2. Demographic Information of Girl Athletes and Sedentary Children Participating in the Research

Variables	Group	N	X±SD	Min.	Max.
Age (Year)	Athlete	35	11,89±,75	11	13
	Sedentary	35	12,11±,79	11	13
Height (cm)	Athlete	35	154,14±5,93	145	164
	Sedentary	35	155,49±6,33	146	168
Body Weight (kg)	Athlete	35	43,71±5,64	36	55
	Sedentary	35	47,11±5,01	38	55
BMI (kg/m2)	Athlete	35	18,32±1,34	15,79	20,89
	Sedentary	35	19,43±1,04	17,09	21,76

When Table 2 is examined, the age of the female athletes is 11.89±.75, their height is 154.14±5.93, their body weight is 43.71±5.64, BMI is 18.32±1.34, the age of the sedentary girls is 12.11 ±.79, height 155.49±6.33, body weight 47.11±5.01, BMI 19.43±1.04.

Table 3. Comparison of Test Results of Male Athletes and Sedentary Children Participating in the Study

Variables	Group	N	X±SD	T	P
Flexibility (cm)	Athlete	35	18,77±3,66	2,727	,008
	Sedentary	35	16,34±3,78		

Standing Long Jump (cm)	Athlete	35	142,31±7,58	10,680	,000
	Sedentary	35	115,00±13,09		
Flamingo (point)	Athlete	35	6,89±1,64	-4,382	,000
	Sedentary	35	8,57±1,57		
Right Grip Force (kg)	Athlete	35	16,20±2,18	,420	,676
	Sedentary	35	16,00±1,78		
Left Grip Force (kg)	Athlete	35	16,54±1,66	2,639	,010
	Sedentary	35	15,46±1,77		
20 Meter Sprint (sec)	Athlete	35	4,37±,17	-3,628	,001
	Sedentary	35	4,61±,34		

p<0,05

When Table 3 is examined, statistically significant differences were detected between the flexibility, standing long jump flamingo balance test, left hand grip strength and 20 meters speed tests of the competing male athletes and sedentary boys, but no significant differences were found according to the results of the right-hand grip strength test.

Table 4. Comparison of Test Results of Girl Athletes and Sedentary Children Participating in the Study

Variables	Group	N	X±SD	T	P
Flexibility (cm)	Athlete	35	4,68±,21	-1,594	,116
	Sedentary	35	4,78±,26		
Standing Long Jump (cm)	Athlete	35	18,77±3,05	2,584	,012
	Sedentary	35	16,94±2,85		
Flamingo (point)	Athlete	35	136,00±7,19	10,441	,000
	Sedentary	35	107,77±14,28		
Right Grip Force (kg)	Athlete	35	7,60±1,03	-4,453	,000
	Sedentary	35	9,34±2,07		
Left Grip Force (kg)	Athlete	35	15,71±1,87	3,142	,002
	Sedentary	35	14,37±1,69		
20 Meter Sprint (sec)	Athlete	35	15,80±2,32	2,656	,010
	Sedentary	35	14,46±1,88		

p<0,05

When Table 4 is examined, statistically significant differences were detected between the standing long jump, flamingo balance test, right hand claw strength, left hand claw strength and 20-meter speed tests of female contestants and sedentary girls, but no significant differences were found according to the results of flexibility test.

RESULT AND DISCUSSION

In this study, which aims to compare the results of selected tests from the Euro-fit test battery applied to sedentary children in the 11-13 age group, who have been involved in alpine skiing for 1-3 years, while no statistically significant differences were found in the right-hand claw strength test of male athletes and sedentary children, statistically significant differences were found in the findings of other motoric tests (flexibility, standing long jump, flamingo, left hand claw strength, 20

m. speed test). The same tests were also applied to female athletes and sedentary children, and while no statistically significant differences were found in the sit-reach flexibility test between the groups, statistically significant differences were found in the findings of other motoric tests (standing long jump, flamingo, left hand claw strength, left hand claw strength, 20 m. sprint test).

Güneş et al. (2019) examined the effect of 8-week alpine skiing training on some variables in children aged 8-10 years, statistically significant differences were determined in the sit-reach and reach test values of girls, and in the pre- and post-test findings. The findings of the study do not show parallelism with the flexibility test measurements of female athletes and sedentary children in our study. The reason is in the study conducted by Güneş et al., the pre-test and post-test measurements of the children who trained for 8 weeks with a technical focus were compared, and it was seen that the applied training program contributed to the development of the flexibility characteristics of the children. However, in our study, the flexibility differences between the children who are engaged in alpine skiing and apply regular training programs and sedentary children were compared, and it is thought that the alpine skiing trainings do not contribute to the extra development of the flexibility values of female athletes.

Yarım et al. (1998), which aimed to compare some physiological characteristics of alpine (n=13) and northern (n=13) male skiers, when the flexibility values of the skiers participating in the research were compared, statistically significant differences were found between the two groups of alpine and northern skiers. The findings of this study show parallelism with the findings of the flexibility test of boys in our study. In the study of Yarım et al., it is seen that the training programs applied by the male Nordic athletes improve the flexibility values of the skiers more than the training programs applied by the male alpine athletes. In our study, it was concluded that alpine skiing training positively affected the flexibility values of the athletes and caused an increase in the flexibility values compared to sedentary children.

In the study of Bilim et al., (2016) in which they examined the flexibility values of sedentary and sporting men in the 12-13 age group, it was stated that there was a statistically significant difference between the groups, which supports the findings of our study.

In another study, Polat et al. (2005), that aimed to examine the relationship between high box test and hexagon hurdle test results and giant slalom performance time, as well as to compare the findings of elite Turkish skiers and athletes from other countries in the literature, a negative relationship was found between giant slalom performance times and flexibility. In addition, when the literature is examined, there are also studies that have studied the flexibility motoric feature with the same age group skier athletes and children from different sports branches (Kocakulak et al., 2018; Hamurcu et al., 2006; Sasa, 2019; İbiş et al., 2004; Saygın et al., 2015; Koçyiğit et al. 2018).

Standing long jump is one of the parameters that develop as explosive power between genders and in all age groups (Yilmaz, 2014). In the study conducted by Bilim et al., (2016), it was determined that the standing long jump test values of the 12-13 age group female athletes, who had a minimum of 1 year of sports history and participated in regular training at a sports course or any sports club at least 2 days

a week, was found to be higher than to the sedentary group. As Yılmaz (2014) stated, the result that the standing long jump and explosive strength characteristics develop in all age groups is in line with the study conducted by Bilim et al., (2016) and the standing long jump findings of female athletes and sedentary children in our study.

Andersen et al. (1990) found statistically significant differences in double-leg jump test findings between club skiers and senior skiers at the provincial level. In the same study, they found a statistically significant relationship between the giant slalom performance times of the skiers and the hexagonal obstacle test, high box test and double leg jump test, and they stated that an on-site test battery could be used to distinguish giant alpine skiers in line with these data.

In another study on the subject in the literature, the Euro-fit test findings were compared by Kızılakşam (2006) in primary school students in Edirne city center who were actively engaged in sports and were sedentary and only attended physical education classes. In the study in which 25 girls and 25 boys who are actively engaged in sports and 25 girls and 25 boys who are sedentary but only attend physical education classes voluntarily participated, significant differences have detected in the standing long jump values of both groups, actively engaged in sports and sedentary girls and boys. The standing long jump findings of male and female athletes in the literature and in our study also support the view of Yılmaz (2014) and it is thought that, like other sports branches, alpine skiing training also improves children's standing long jump and explosive strength motoric features. In the literature, there are different studies (Polat et al., 2005; Kızılet Bozdoğan, T., Kızılet, A. 2017; Okudur, 2012; Cinthuja et al., 2015; Işıldak, 2020) from the results related to the standing long jump motoric characteristics of the children in our study.

The flamingo balance test, created in line with the Euro-fit test battery norms, is a test method in which the level of balance needed in the athlete and the strength of the muscle groups involved in balance are determined (EUROFIT, 1988).

In the study conducted by Bilim et al., (2016), it was found that the flamingo balance test values of 12-13 age group female athletes, whose sports history is at least 1 year, or who participated in regular training at any sports club, at least 2 days a week, were determined to be higher than the sedentary group. Significant differences were also found between the flamingo balance test findings of alpine skiing female athletes and the findings of sedentary girls in our study, which supports the study of Bilim et al. It is thought that due to the close distances between the gates in alpine skiing, such as slalom racing, it improves the balance characteristics of the athletes, and the extra balance performance of the athletes greatly affects their race success.

Güneş et al. (2019) examined the effect of 8-week alpine skiing training on some variables in children aged 8-10 years, statistically significant differences were found in the flamingo test data of boys in the pre- and post-tests.

In the study of Saka and Polat (2009) aiming to determine and compare the balance test results of alpine ski athletes, balance characteristics of alpine skiers (n=15/male) and sedentary (n=10/male) children were compared. In all static and dynamic functional balance tests, the athlete group achieved more successful results than the control group. Significant differences were found between the athlete and

the sedentary group in the test of standing on one leg for both legs, right and left legs separately. Significant differences were found between the athlete and the sedentary group in the right leg three-step bounce test.

Elite level alpine skiers participated in the study conducted by Aktaş (2009) and examined and evaluated the effect of balance on performance in the study. In the comparisons made within the group, statistically significant differences were found between the balance tests of the skiers in the experimental (n=15/male) and control (n=15/male) groups. The researcher thinks that as a result of balance training, the balance performance of the skiers in the experimental group increased higher and faster.

Erikoğlu et al., (2015) found statistically significant differences in flamingo balance findings between active football players and their sedentary counterparts in a study they aimed to compare the Physical Fitness Parameters of Male Adolescent Football Players with the Eurofit Test Battery and their sedentary counterparts.

Studies in the literature on the balance test of children who are engaged in different sports and alpine skiing show that it is thought that the sports that children do develop the muscle groups involved in the balance motor feature (EUROFIT, 1988) and increase their balance performance.

According to the flamingo balance test findings of our study, it is thought that due to the characteristic feature of alpine skiing, balancing on skis requires extra strength and effort, and therefore, small age group children who do alpine skiing develop the muscle groups and balance characteristics necessary for balance. In the literature, the balance motoric feature is included in different studies (Suna et al., 2016; Malliou et al., 2004; Hintermeister et al., 1997) on the children in our study, with similar age groups, in different sports branches, and on athletes engaged in skiing.

In the study conducted by Bilim et al., (2016), it was found that the hand grip strength of girls in the 12-13 age group, who had a minimum of 1 year of sports history and participated in regular training at least 2 days a week in a sports course or any sports club, was higher than the sedentary group. In the same study, it was determined that the hand grip strength of the 12-13 age group boys who do sports is higher than the sedentary group. Both right- and left-hand grip strength test findings of female athletes in our study show significant differences compared to the findings of sedentary children. It is thought that the extra force applied by the athletes to the pole grips as the speed increases during skiing and during the transitions between the doors improves the hand grip muscle groups of the athletes.

Çiçek et al., (2018) conducted a study on 16 male swimmers aged 10-13 and 17 boys who did not do sports, and they found that the hand grip strength of the group doing sports was higher than the sedentary group. The researcher thinks that this difference is due to regular exercise.

While the findings of the study do not show parallelism with the findings of the right-hand grip strength of male athletes and sedentary children in our study, the findings of the left-hand grip strength show parallelism. While a difference was found in the left-hand grip strength of male athletes and sedentary children in our study, it is thought that the reason why no difference could be detected between the

right-hand grip strength was due to the fact that the children generally use their right hands.

In another study on the subject in the literature, Yarım et al. (1998), which aimed to compare some physiological characteristics of alpine (n=13) and northern (n=13) male skiers, no statistically significant differences were found between the right- and left-hand grip strength test findings of alpine skiers and northern skiers.

In the study of Hekim et al., (2012), which aimed to compare some motoric characteristics of 10-12 age group athlete (n=22) and sedentary (n=22) girls, it was determined that there was no statistically significant difference between the 30-meter running performances of sports and sedentary children. The 20 m. sprint test findings of our study do not support this study in the literature. The reason why it does not show parallelism is thought to be due to the fact that the female skiers in our study, who do alpine skiing, have done extra land training in their training programs for the development of their speed performance, improving the speed motoric characteristics of the athletes.

In the study of Kürkçü and Güler (2019), 20 male handball players aged 10-12 and 14 boys participated voluntarily as the control group. In the study, statistically significant differences were found between the handball players and the control group according to the 20 m. sprint test results.

Aydın (2019) applied a 30-meter speed test to determine the speed characteristics of 11-13 age group football players in his study. Statistically significant differences were determined in the pre- and post-test findings of the study group and the control group in the 30-meter speed test applied.

According to the 20 m. sprint test results of our study, significant differences were found between the alpine ski athletes and the 20 m. sprint test results of sedentary children. In our study, it is seen that the land training applied extra in the training of the male skiers, as in the alpine girl skiers, improves the 20 m speed characteristics. As seen in the research of Kürkçü and Güler (2019) and Aydın (2019) on the sports branches performed on land, it is seen that the training done on the land improves the 20 m. speed motoric feature. In order for skiers who are engaged in skiing to develop these motoric features, they need to include extra speed training on land in their training programs, and it is thought that these trainings will increase their performance.

In the study titled "Comparison of Flexibility, Endurance and Speed Parameters of National Team Level Male (n=16) and Female (n=16) Athletes and Ski Athletes" by Sasa (2019), significant differences were found between the gender variable and the speed parameters. It was determined that there was no significant difference between the type of sport being played, the body mass index variable, the age variable, and the speed parameters. In addition, it was determined that there was a significant relationship between endurance and flexibility parameters and speed parameter.

Diallo et al. (2001) found statistically significant differences between the 20-meter, 30-meter and 40-meter sprint test results of exercises performed 3 days a week in children aged 10-12. In addition, there are different studies in the literature that study the speed motor feature (Kıyıcı & Kışalı 2010; Kıyıcı & Kışalı 2006; Seifert et al., 2017; Koçyiğit & Şahinler, 2019) and related to our study.

CONCLUSION

As a result, it is thought that the land training, which is included in the training programs of the developmental girls and boys who do alpine skiing, in addition to their training programs on snow, when combined with the characteristic features of alpine skiing, contributes to the development of the athletes' muscle system, skeletal system and motoric features. It is considered that the Eurofit test battery is of great importance in the skill selection studies applied to children in the developmental age for alpine skiing.

ACKNOWLEDGEMENT

Thank you to all the participants who are willing to complete this research.

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Indonesian Journal of Sport Management

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