

Original Article

Rhythm Skill Copmarison Between University Students

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Keywords: *Rhythm, movement, biomotor, exercise, student.***Abstract**

The aim of this study is to examine the relationship between rhythm skills and some biomotor skills that may affect this skill of the students who regularly receive sports training. Therefore; 45 Medical Faculty and 33 Sport Sciences Faculty students who have been studying at the Higher Education Institution for at least 2 years participated in the study voluntarily. Rhythm skill test, balance test, standing long jump test, musical and physical intelligence tests were applied to the participants. As a result; it was determined that there was a significant difference between high tempo (132 bpm) rhythm skills in favor of the sports group. As a conclusions, it can be said that these differences will increase if there are more intensive courses on rhythm skills when the selection of students who will receive sports training and the content of their education are examined.

1. Introduction

For athletic success, coaches make an intense effort to develop mental and biomotor features. They aim to be successful in the competition with the training loads they apply to their athletes in different environments and conditions. Many studies have shown that; The athlete's intelligence level, mental skills, coping strategies with psychological factors and the level of biomotoric characteristics affect the competitive performance of the athletes (Hijazi, 2020; M Söğüt, 2009). On the other hand, there is a need for study results on the relationship between rhythm skill and sportive success.

Rhythm is the complex events of the muscle and nervous system and provides the order in the flow of movements. Rhythm; "It can be defined as performing, hearing, seeing or feeling movements in groups one after the other in a certain and regular manner (Doğan & Altay, 1990; Lay et al., 2002). Rhythm is

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needed for all coordinated movements to be performed correctly (Danna et al., 2015; Effenberg, 2005), and sports skills are accepted as rhythmic in nature without exception (Bennett & Riemer, 1995; Gallahue & Donnelly, 2003; Kirchner, 1981). Well-developed rhythm-movement patterns play a role in successful learning of various physical activities as well as in athletic performance (Kašparová, Doležalová, & Novotná, 2021). Rhythm ability is defined as the ability to apply the external sound and the visually given rhythm, that is, to perform it. This ability helps to perform in a certain flow and order in sportive movements in sports that require very technical skills (such as swimming, hurdle running, dance, artistic and rhythmic gymnastics, ice skating, etc.). it also helps to control the basic elements of movements (muscle tension, speed, rhythm) (Erkut Atilgan & Pinar, 2005; Segal, 2005). According to Gallahue & Donnelly (2003), locomotor and non-locomotor activities performed at different tempos and intensities help learn movement in a perfect flow, and the basic elements of rhythm improve sportive skills. It is thought that rhythm skills and sportive movements are related, but there is no study in the literature. Based on this information, does the rhythm skill improve with training? Or does sportive training have an effect on rhythm skills? Finding answers to these questions was the aim of this study.

2. Material and Methods

Participants. A total of 78 students, including (n=45) Medical Faculty students (Medicine group) and (n=33) Sports Sciences Faculty students (Sports group), who have been studying at the Higher Education Institution for at least 2 years, participated voluntarily. Rhythm skill test, balance test, standing long jump test, musical and physical intelligence tests were applied to the participants.

Ethical approval: All participants signed the consent form stating that they voluntarily participated in the study. Also, this study received ethical approval with the decision of the Ethics Committee of Canakkale Onsekiz Mart University Graduate Education Institute.

Data collection tools. Balance test: The flamingo balance test was applied to measure the balance skills of the participants. In this test, the participants stand on a 50 cm long, 5 cm high and 3 cm wide wooden board with one foot of their choice and stand for 60 seconds. waited. Participants were asked to bend their free foot back in the waiting position and hold it with their arm in the same direction. He was assisted by the observer until he took the correct position. When the participant was ready, he let go of the assistant's hand and the stopwatch was started at the same time. The stopwatch was stopped each time when the athlete dropped his foot, or any part of his body touched the ground and was restarted when he was in the correct position. 60 sec. Each balance loss of the participant was recorded throughout.

Standing long jump: Used to measure participants' leg strength. In this test, participants stood at a designated point and jumped forward with both feet. The distance (m) between the line where the participants started to jump and the nearest footprint where the jump was completed was recorded. The maximum distance that the participants could jump was multiplied by their body weight to obtain a value in kg*m.

Musical and physical intelligence: The “Multiple Intelligence Inventory” developed by Özden (2008) was applied to measure the musical and physical intelligence levels of the participants. Multiple intelligences inventory is 5-point Likert type and each section consists of 10 items. The items were prepared according to the five-point grading system and were graded as “Not at all Suitable for Me (1), Very Little Suitable for Me (2), Partially Suitable for Me (3), Fairly Suitable for Me (4), Completely Appropriate for Me (5). The scores of the participants in the musical and bodily intelligence sections of the multiple intelligence inventory vary between 10-50.

Rhythm skill test: Rhythmic Competence Analysis Test (RCAT), developed by Weikart (1989), was used to measure the rhythm skills of the participants. This test was applied at two different tempos, 120 and 132 bpm. In this test, the participants performed the rhythm-accompanied movements of hitting the knees with two hands, hitting the knees with both hands alternately, sitting down counting, standing still, walking forward, walking backwards. The observer gave 3, 2 or 1 points according to the success of the application in a synchronized manner with the metronome.

Statistical Analysis. The obtained data were analyzed with the SPSS program. In pairwise comparisons, t-test was used for independent groups, and simple linear correlation analysis was used to examine the reciprocal relationship. Findings were considered significant at the $p < 0.05$ level.

3. Results and discussions

Data regarding the demographic information of the participants are shown in Table 1. Accordingly, the average age of the participants was 20.07 ± 1.214 years, the average height was 171.59 ± 7.319 cm, and the average body weight was $66.47 \pm 11,660$ kg.

The results of the t test for independent groups, which were conducted to determine whether the observed variables according to the groups of the participants differ significantly or not, are shown in Table 2. Accordingly, the strength, physical intelligence and rhythm variables of the sports group were 132 bpm in the medicine group statistically higher scores ($p < 0.05$). On the other hand, there was no significant difference between the groups in the variables of balance, musical intelligence and rhythm 120 bpm ($p > 0.05$).

The results of the simple linear correlation analysis performed to examine the relationship between rhythm skills and balance, strength, musical intelligence, and physical intelligence skills according to the groups of the participants are shown in Table 3. Accordingly, it was observed that there was a significant relationship between the rhythm (120 bpm) skill of the sports faculty group and the musical and physical intelligence scores ($p < 0.05$). In the medical faculty group, there was a significant relationship only between rhythm (132 bpm) skill and musical intelligence scores ($p < 0.05$). However, there was a negative correlation between balance and rhythm (120-132 bpm) skills in the sports group and between balance and rhythm (120 bpm) in the medicine group, but this was not statistically

significant ($p>0.05$). In addition, it was determined that there was a negative relationship between strength and rhythm (120-132 bpm) skill in the sports group and a positive relationship in the medicine group, but it was not statistically significant ($p>0.05$).

Table 1. Demographic variables of participants

Variables	Sport Students (n=33)		Medical Students (n=45)		Total (n=78)	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
Age (year)	19,9	1,536	20,3	,869	20,07	1,214
Body height (cm)	171,45	8,422	171,69	6,490	171,59	7,319
Body weight (kg)	65,09	11,264	67,49	11,965	66,47	11,660

Table 2. Biomotorical performance of participants

Variables	Sport Students (n=33)		Medical Students (n=45)		t	p
	\bar{X}	SD	\bar{X}	SD		
Balance	3,24	3,162	4,48	3,603	-1,588	,116
Leg strength (kg*m)	120,99	36,341	99,96	36,998	2,498	,015*
Musical intelligence	30,60	7,049	30,97	6,947	-,231	,818
Bodily intelligence	40,27	5,045	35,79	6,278	3,361	,001*
Rhythm 120 bpm	2,09	,501	2,01	,49	,663	,509
Rhythm 132 bpm	2,32	,497	2,07	,542	2,004	,049*

* $p<0,05$

Table 3. Correlation between rhythm and biomotor variables

Groups	Rhythm Type		Balance	Leg Strength	Musical Intelligence	Bodily Intelligence
Sport students (n=33)	Rhythm (120 bpm)	r	-,136	-,299	,501	,360
		p	,451	0,91	,003*	,040*
	Rhythm (132 bpm)	r	-,143	-,115	,258	,170
		p	,426	,524	,147	,345
Medical student (n=45)	Ritim (120 bpm)	r	-,010	,087	,059	,130
		p	,946	,568	,706	,399
	Ritim (132 bpm)	r	,195	,031	,323	,274
		p	,198	,838	,033*	,072

* $p<0,05$

Discussion

This study was conducted to examine the rhythm skills and sportive performance elements of students who received and did not receive sports training. In the results of working; While there was no significant difference between the groups in medium tempo (120 bpm) rhythm skills, it was determined that there was a significant difference in favor of the sports group in high tempo (132 bpm)

rhythm skills. In addition, while balance skill and musical intelligence scores did not differ between the groups, it was seen that the sports group scored statistically better between strength skills and physical intelligence scores. Considering that almost all sports branches include locomotor movements (Barrett et al., 2016), and many of them require strength and orientation skills (Minz, 2003), it is thought that the reason why the strength skills and physical intelligence scores of the sports group are higher than the medical group is due to their more motoric activities. From this point of view, it can be said that more motor activities can help increase bodily intelligence and strength skills.

As a result of the analysis, it was determined that medium tempo rhythm skill (120 bpm) in the sports group had a positive and significant relationship between musical intelligence and physical intelligence, and high tempo rhythm skill (132 bpm) in the medical group. On the contrary, it was determined that rhythm skill did not have a significant relationship with strength and balance performance in both groups. In other words, it can be said that leg strength and balance skill have a limited effect on rhythm skill. However, it is thought that there may be different performance parameters that will affect the rhythm skill.

While there are no findings to compare rhythm skills with athletes in different branches, there are studies reporting that rhythm training contributes significantly to technical skills in different branches (Doğan & Altay, 1990; Zachopoulou et al., 2000; Zachopoulou & Mantis, 2001). On the other hand, there is a need for more study findings examining the difference of this situation in different branches. In the results of working; As expected, the strength performance and physical intelligence scores of the students studying in the field of sports differed from the other students. On the other hand, while only high tempo rhythm skills differed from other students, balance and musical intelligence scores did not differ.

In a study conducted by (Mustafa, Söğüt & Kirazci, 2014), it was concluded that children aged 11-12 who play tennis have higher rhythm skills at different tempos than children who are not active. Although there is an age difference between the participant groups of this study and the current study, according to this result, it can be said that rhythm skill is related to sports in different age groups and individuals who do sports have a higher level of rhythm skills. Darius (2008) and Brod'ani (2012) stated in the results of their studies that with the increase in harmonic abilities, the level of skill performance also increased, and performance errors decreased. Similarly, Tanır (2019) in his study revealed that teaching the tourniquet skill in basketball with rhythmic activities is more successful than the traditional teaching method. In the study conducted by Sommer et al. (2009), it was determined that there was a significant difference in favor of post-test in golf-specific technical skill of 4-week rhythm practice in experienced golf players. All these results support the conclusion that the athlete group in the current study had a better rhythm skill level. In addition, there is also evidence that rhythm training improves branch-specific technical performance. Kim, Han and Han (2018) found that interactive metronome exercise twice a week for 6 weeks could optimize swing timing and brain connectivity variability in professional golfers. This result shows that engine learning and performance can be improved with

engine timing optimization. However, these studies shed light on the relationship between motor skills and technical skills specific to the sport branch with rhythm skills. However, there is a need for more studies examining rhythm skills according to sports branches.

In the light of these data, it can be said that the selection of students who will receive sports training and the content of their education will contribute to the development of the athlete to have more intensive courses on rhythm skills.

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