BİREYSEL VE TAKIM SPORCULARININ TOPARLANMA BİLGİ DÜZEYLERİNİN KARŞILAŞTIRILMASI

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Özet

Fiziksel yüklenme yoğunluğunun yüksek olduğu egzersiz türlerinde sporcularda yorgunluk artarak sportif performansta önemli oranda azalmalar meydana gelebilmektedir. Sporcuların egzersiz sonrası gerçekleştirdikleri verimli bir toparlanma süreci kuşkusuz sonraki performanslar için de önem kazanmaktadır. Literatürde toparlanma ile ilgili çalışmalar incelendiğinde genel anlamda toparlanma ve performans, toparlanmanın fizyolojik ve psikolojik etkileri ile toparlanma yöntemleri gibi konular ele alınmıştır. Fakat bireysel ve takım sporcularının toparlanma konusundaki bilgilerinin ne düzeyde olduğu ve sporcuların bu bilgileri pratikte kullanıp kullanmadıklarına dair çalışmaların kısıtlı olduğu görülmüştür. Bu anlamda bu çalışma, bireysel ve takım sporcularının egzersiz sonrası toparlanma yöntemleri hakkındaki bilgi düzeylerini ve görüşlerini karşılaştırmak ve değerlendirmek amacıyla gerçekleştirilmiştir. Çalışmaya 115 bireysel sporcu ve 112 takım sporcusu olmak üzere toplam 227 katılımcı dâhil edilmiştir. Veri toplama aracı olarak katılımcıların demografik özelliklerini, alışkanlıklarını, bilgi düzeylerini ve toparlanma yöntemleri hakkındaki görüşlerini belirlemek için Aydemir ve arkadaşları (2020) tarafından geliştirilen Sporda Toparlanma Bilgi Testi (STBT) ölçeği kullanılmıştır. Verilerin analizinde tanımlayıcı istatistiklere ek olarak normal dağılım gösteren verilerde gruplar arasındaki farkı belirlemek için parametrik testlerden t-testleri ve ANOVA testleri kullanılmıştır. Spor branşı bakımından STBT düzeyinin bireysel sporcularda 6'sının (% 5,2) zayıf, 84'ünün (% 73,1) orta ve 25'inin (% 21,7) iyi düzeyde olduğu belirlenmiştir. Bu değerler takım sporcularında 5'inin (% 4,5) zayıf, 86'sının (% 76,7) orta ve 21'inin ise (% 18,8) iyi olduğu tespit edilmiştir. Bireysel sporcularda STBT puanının 53,22 puan, takım sporcularında ise 54,04 puan olduğu ve aralarında istatistiksel olarak anlamlı bir fark olmadığı görülmüştür (p>0.05). Sonuç olarak bu çalışmada bireysel ve takım sporcularının Sporda Toparlanma Bilgi Testi düzeyleri arasında anlamlı bir fark olmadığı söylenebilmektedir.

Anahtar Kelimeler: Bireysel sporcu, Takım sporcuları, Toparlanma.

COMPARISON OF RECOVERY KNOWLEDGE LEVELS OF INDIVIDUAL AND TEAM ATHLETES

Abstract

In exercise types where physical load intensity is high, fatigue increases in athletes and a significant decrease in sportive performance may occur. An efficient recovery process for athletes after exercise is undoubtedly important for subsequent performances. When studies on recovery are examined in the literature, subjects such as recovery and performance, physiological and psychological effects of recovery, and recovery methods are discussed. However, it has been observed that studies on the level of knowledge of individual and team athletes on recovery and whether the athletes use this knowledge in practice are limited. In this sense, this study was conducted to compare and evaluate the knowledge levels and opinions of individual and team athletes about recovery methods after exercise. A total of 227 participants, 115 individual athletes and 112 team athletes were included in the study. Sports Recovery Knowledge Test (SRKT) scale developed by Aydemir et al. (2020) determined the participants' demographic characteristics, habits, level of knowledge and views on recovery methods. In the analysis of the data, in addition to descriptive statistics, t-tests and ANOVA tests, which are parametric tests, were used to determine the difference between the groups in normally distributed data. In terms of the sports branch, it was determined that 6 (5.2%) of the individual athletes had a weak level of SRKT, 84 (73.1%) were at a moderate level and 25 (21.7%) were at a good level. It was determined that 5 (4.5%) of these values were weak, 86 (76.7%) moderate and 21 (18.8%) good in team athletes. It was determined that the SRKT score was 53.22 points in individual athletes and 54.04 points in team athletes, and there was no statistically significant difference between them (p>0.05). As a result, it can be said that there is no significant difference between the Sports Recovery Knowledge Test levels of individual and team athletes in this study.

Key Words: Individual athlete, Team athletes, Recovery.

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INTRODUCTION

The importance of sportive performance is increasing day by day. The way to increase the athlete's performance is to include the ideal training for the athlete in the annual training planning and to ensure the athlete's optimal rest and recovery (Siegel & Laursen, 2012). In this context, the factors affecting the performance of the athlete can also negatively affect the recovery process and reduce the performance of the athlete. Inadequate or deficient nutrition programs and the relationship between loading and rest become very important in terms of mental stress, being unable to control fear and irritability, performance and therefore recovery. At this point, recovery after exercise, which is the other pillar of increasing sportive performance, comes into play (Walker & Nordin, 2010; Bali, 2015).

When athletes do not have an effective recovery process, sports injuries increase, the immune system weakens, the pain threshold increases and performance decreases. Failure to eliminate these factors may cause the athlete to stay away from sports (Aydemir, Mirzeoğlu, & Kolayiş, 2022). In this sense, recovery methods and techniques applied by individual and team athletes after high-intensity physical exercise gain importance in this respect. It is thought that the methods that athletes will apply after a physical activity, exercise, training, or competition are a very important process in terms of both reducing their fatigue and being more successful in their next sporting performance (Dupont, Nedelec, Mccal, & Berthonin, 2015).

In recent years, many sports scientists and trainers have been conducting scientific studies to get rid of fatigue at the highest level in order to effectively remove metabolic wastes formed in the organism after the end of physical exercise intensity and to increase sportive performance. Athletes come to the fore as a part of their daily lives in order to achieve maximum physical, physiological, and psychological performance, that is, to recover effectively. In this sense, it is important for the organism to return to its resting level and to recover effectively and efficiently (Ament & Verkerke, 2009). The recovery process is the event that the fatigue of the athlete at the end of the exercise is reduced or completely eliminated by some methods and techniques, and the energy stores are restored to the resting level (Kellmann, Bertollo, Bosquet, Brink, Coutts, & Duffield, 2018).

There are many recovery methods that athletes use after or independently of exercise. Sports scientists do a lot of research on these methods and try every aspect to find the most effective method (Haff & Triplett, 2015). Considering the diversity of recovery methods; active recovery (low jogging, jogging, stretching), passive recovery (sleeping, sitting), massage, cold application (cryotherapy), immersion therapy (hydrotherapy), hot and cold application

(contrast-opposite water application), nutrition, fluid intake, ergogenic supports, electromyostimulation (tens), drug support (pharmacological - anti-analgesic support), ultrasound and pressure clothing, lifestyle improvement and psychological relaxation method. Although studies on these methods continue, their use efficiencies are also discussed (Tessitore, Meeusen, & Cortis, 2007; Venter, Potgieter, & Barnard, 2009). In addition to these, it is known that there are less frequently applied methods such as breathing exercises, listening to music, yoga therapies, and meditation. While research on these methods continues, their clinical effectiveness is also discussed (Venter, Potgieter, & Barnard, 2009). When the studies conducted in general are examined, studies investigating the effects, importance, and physiological and psychological effects of recovery methods on fatigue and performance come to the fore. However, it is seen that the studies on the knowledge levels of the athletes about the recovery methods applied after the exercise and the application intervals of these methods are quite limited. For this reason, this research was carried out to compare the opinions and thoughts of the athletes who are interested in individual and team sports about recovery, as well as the level of knowledge about recovery in sports and the frequency of use of these methods.

MATERIAL AND METHOD

The ethics committee of this research unanimously decided to comply with the ethical principles at the 2022/08-49 protocol and E-34183927-000-00000791985 meeting held on 27.12.2022 by the Aksaray University/Human Research Ethics Committee.

Research Model

This research was designed in the descriptive survey model, one of the quantitative research methods that examine and compares the methods and techniques, application intervals, and knowledge levels applied by individual and team athletes regarding recovery. The data collection phase was carried out by questionnaire and scale method.

Research Group

The universe of the research consists of athletes studying at Aksaray University/Faculty of Sports Sciences. The sample group consists of 227 active athletes who are studying in the Department of Coaching and Sports Management of the said faculty and are interested in individual or team sports. The demographic characteristics of the participants are presented in Table 1.

Data Collection Tools

In this study, data collection stages were carried out by using the demographic characteristics of the athletes and the recovery levels by using the Sports Recovery Knowledge Test (SRKT) scale (Aydemir, Mirzeoğlu, & Kolayiş, 2020).

Personal Information Form

A questionnaire was created in order to learn the personal information of the athletes participating in the research, their unique behaviors, and their views on recovery. The questions in the questionnaire include questions such as age, gender, type of sports branch, and sports history (how many years he has been doing sports).

Survey

The descriptive part of the questionnaire, which includes the personal information of the athletes (A), sleep, nutrition, and habits (B), and the frequency of use of recovery methods and related opinions (C), consists of two parts. The frequency of use of 12 recovery methods determined based on the literature by the athletes was determined by a 5-point Likert scale; Evaluated 1-Never, 2-Very rarely, 3-Sometimes, 4-Frequently, 5-Always. Their views on these methods were evaluated with a 5-point Likert scale according to the options 1- Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Completely Agree.

Sports Recovery Knowledge Test Scale (SRKT)

The Sports Recovery Knowledge Test is a valid and reliable test by Aydemir, Mirzeoğlu, & Kolayiş, (2020) and it determines the extent to which assistants and athletes prove their knowledge of recovery methods. In the scale of this test, validity, and reliability analysis was performed with the participation of a total of 159 athletes aged between 18 and 30. The test's mean score = 8.80, standard deviation = 3.48, mean difficulty = 0.62, and Kuder Richardson's 20 reliability coefficient = 0.80. The prevalence according to the method Sports Recovery Knowledge Test is the seventh, and it is an easy, useful, and important test method especially for active athletes to determine the height, to determine those who know and those who do not. The room system of the test is evaluated over a system of 100. The scoring game gives each monster an equal (7.14) point. Scoring is done only on correct answers. 0-20 points "very poor", 21-40 points "weak", 41-60 points "medium", 61-80 points "good" and 81-100 points "very good" knowledge level (Aydemir, Mirzeoğlu, & Kolayiş, 2020).

Data Collection

The questions in the questionnaire were tried to be prepared in a qualified way by taking the opinions of experts in the field after a comprehensive scanning. The data collection phase was carried out through face-to-face interviews. The questions and tests in the questionnaire were

conducted in the morning, considering that the athletes would feel less mentally tired in an environment where they felt better and more comfortable. Before the data collection phase, the athletes were informed about the questionnaire and the test, and voluntary consent form approval was obtained. The principal investigator gave information so that there would be no empty questions while answering the questions that were not understood in the test. In order to avoid any uneasiness among the athletes, personal information such as name and surname was not requested from the survey data.

Analysis of Data

Descriptive statistics and statistical differences of data were calculated using SPSS 24.0 package program. In the study, the scale scores were calculated and the kurtosis and skewness coefficients were examined to determine the conformity of the scores to the normal distribution. Parametric tests were used because the kurtosis and skewness values obtained from the scales were between +3 and -3 for the normal distribution. T-test and ANOVA tests were used to examine the change in scale score according to demographic characteristics. The level of significance for all data obtained was determined as $p < 0.05$.

RESULTS

In this part of the research, the results including the frequency of use of recovery methods and their opinions are presented in tables.

Table 1. Demographic characteristics of the participants.

Variables	Category	N	%
Age	17-19	22	9,7
	20-22	167	73,6
	23 +	38	16,7
Gender	Female	101	44,5
	Male	126	55,5
Type of Sports Branch	Individual	115	50,7
	Team	112	49,3
Year of Sports Resume	3-4	26	11,5
	5-6	36	15,9
	7-8	52	22,9
	9 +	113	49,8

When the distribution of the athletes participating in the research according to their age is examined it is seen that 22 (9,7%) are 17-19 years old 167 (73,6%) are 20-22 years old and 38 (16,7%) are 23. Considering the distribution by gender, it was determined that 101 (44,5%) were female and 126 (55,5%) were male. In terms of the type of sports branch, it was

observed that 115 (50,7%) of them were interested in individual sports and 112 (49,3%) in team sports. When the distribution according to the background status is examined, 26 (11,5%) of them have 3-4 years, 36 (15,9%) of them 5-6 years, 52 (22,9%) of them 7-8 years and 113 (%) it was determined that (49.8) of them had a sports background for 9 years.

Table 2. Percentage distribution of demographic characteristics by sport type.

| Variables | Category | Sports Branch Type | | | |
| | | Individual | | Team | |
		N	%	N	%
Age	17-19	5	4,3	17	15,2
	20-22	86	74,8	81	72,3
	23 +	24	20,9	14	12,5
Gender	Female	48	41,7	53	47,3
	Male	67	58,3	59	52,7
Year of Sports Resume	3-4	13	11,3	13	11,6
	5-6	21	18,3	15	13,4
	7-8	19	16,5	33	29,5
	9 +	62	53,9	51	45,5
Level of Recovery in Sports	Low	6	5,2	5	4,5
	Middle	84	73,1	86	76,7
	Good	25	21,7	21	18,8

Percentage changes in the age, gender, and year of sports history of individual and team athletes participating in the research are given in detail. Table 2. also shows the general frequency distribution of the athletes' knowledge of recovery in sports. While 6 (5,2%) of individual athletes were low 84 (73,1%) were middle and 25 (21,7%) were good, these values were lower than 5 (4,5%) of team athletes low 86 (76,7%) middle and 21 (18,8%) good.

Table 3. Athletes' scale score average results.

Variables	N	Minimum	Maximum	$\bar{X}\pm$S.D.
Sleep, Nutrition and Habits	227	10	35	21,75±4,20
Recovery Methods and Frequency of Use	227	13	59	35,07±7,84
Opinions on Recovery Methods	227	10	20	18,55±2,06
Sports Recovery Knowledge Test	227	27	79	53,63±8,51

The average score for sleep, nutrition, and habits of the athletes participating in the research is 21,75±4,20, the average score for recovery methods and frequency of use is 35,07±7,84, the average score of opinions about recovery is 18,55±2,06 and in sports, it is seen that the average of the recovery knowledge test scores is 53,63±8,51.

Table 4. Comparison of athletes' scale score average results.

Variables	Category	N	$\bar{X}$	S.D.	t	P
Sleep, Nutrition and Habits	Individual	115	21,80	4,67	-0,170	0,865
	Team	112	21,71	3,67		
Recovery Methods and Frequency of Use	Individual	115	34,71	7,53	0,704	0,482
	Team	112	35,45	8,16		
Opinions on Recovery Methods	Individual	115	18,50	2,10	0,342	0,732
	Team	112	18,60	2,02		
Sports Recovery Knowledge Test	Individual	115	53,22	8,19	0,732	0,465
	Team	112	54,04	8,84		

In the comparison of the knowledge levels of individual and team athletes participating in the study, sleep, nutrition, and habits (t= -0.170; p= 0.865), recovery methods and frequency of use (t= 0.704; p= 0.482), views on recovery (t= 0.342); p= 0.732), and the numerical difference between the scores of the sports recovery knowledge test (t= 0.732; p= 0.465) was not statistically significant (p>0.05).

Table 5. Comparison of scale score mean results in terms of age.

Variables	Category	N	$\bar{X}$	S.D.	ANOVA F	ANOVA P
Sleep, Nutrition and Habits	17-19	22	20,68	4,54	6,853	0,001*
	20-22	167	21,40	3,77		
	23 +	38	23,95	5,08		
	Total	227	21,75	4,20		
Recovery Methods and Frequency of Use	17-19	22	37,23	7,26	7,564	0,001*
	20-22	167	33,92	7,58		
	23 +	38	38,89	7,98		
	Total	227	35,07	7,84		
Opinions on Recovery Methods	17-19	22	18,32	2,36	2,951	0,054
	20-22	167	18,74	1,78		
	23 +	38	17,87	2,81		
	Total	227	18,55	2,06		
Sports Recovery Knowledge Test	17-19	22	55,55	7,98	4,348	0,014*
	20-22	167	52,66	8,19		
	23 +	38	56,76	9,39		
	Total	227	53,63	8,51		

In the comparison of the sports recovery knowledge levels of the athletes participating in the research, sleep, nutrition, and habits (F= 6.853; p= 0.001), recovery methods and frequency of use (F= 7.564; p= 0.001) and the sports recovery knowledge test (F= 4.348; p= 0.014)), statistically significant differences were found between the scores (p<0.05). According to the average score results, sleep, nutrition and habits, recovery methods and frequency of use, and the sports recovery knowledge test scale scores of the athletes aged 23 and over were found to be significantly higher than those of the 17-19 and 20-22 age groups (p<0.05).

Table 6. Comparison of scale score mean results in terms of gender.

Variables	Category	N	$\bar{X}$	S.D.	t	P
Sleep, Nutrition and Habits	Female	101	19,56	3,82	-7,942	0,000*
	Male	126	23,51	3,63		
Recovery Methods and Frequency of Use	Female	101	34,55	7,88	-0,895	0,372
	Male	126	35,49	7,81		
Opinions on Recovery Methods	Female	101	18,63	1,83	0,542	0,588
	Male	126	18,48	2,24		
Sports Recovery Knowledge Test	Female	101	53,19	8,36	-0,693	0,489
	Male	126	53,98	8,64		

Statistically significant differences were found between sleep, nutrition, and habits (t= -7,942; p= 0.000) scale scores in the comparison of the sports recovery knowledge levels of the athletes participating in the study in terms of gender (p<0.05). According to the mean scores, sleep, nutrition, and habits scale scores of male athletes were found to be significantly higher than female athletes (p<0.05). The numerical difference between the recovery methods and frequency of use between the genders, opinions about recovery methods, and the scores of the sports recovery knowledge test scale were not statistically significant (p>0.05).

Table 7. Comparison of average scores of scale results in terms of resume.

Variables	Category	N	$\bar{X}$	S.D.	ANOVA	
					F	P
Sleep, Nutrition and Habits	3-4	26	19,31	4,77	5,218	0,002*
	5-6	36	21,64	4,89		
	7-8	52	21,15	3,20		
	9 +	113	22,63	4,00		
Recovery Methods and Frequency of Use	3-4	26	31,69	7,26	2,760	0,043*
	5-6	36	34,25	7,87		
	7-8	52	34,69	7,55		
	9 +	113	36,29	7,90		
Opinions on Recovery Methods	3-4	26	18,69	1,76	0,177	0,912
	5-6	36	18,39	2,70		
	7-8	52	18,46	1,83		
	9 +	113	18,61	2,02		
Sports Recovery Knowledge Test	3-4	26	50,38	8,57	2,363	0,072
	5-6	36	52,64	9,82		
	7-8	52	53,15	7,97		
	9 +	113	54,90	8,13		

When the sports recovery knowledge levels of the athletes participating in the research were compared in terms of their previous years of doing sports, statistically significant differences were found between sleep, nutrition, and habits (F= 5.218; p= 0.002), and recovery methods and frequency of use (F= 2.760; p= 0.043) (p<0.05). According to the average score results, it was determined that the sleep, nutrition and habits, recovery methods, and frequency of use

of the participants who have been doing sports for 9 years and over are significantly higher than those who have a sports history for 3-4, 5-6 and 7-8 years ($p < 0.05$).

DISCUSSION

It is important for athletes to perform physical recovery efficiently in their subsequent performance. Especially at the end of high exercise intensity, many different methods are applied to provide physical recovery and make this process faster. For this reason, the habits and related views of individual and team athletes constitute the hypothesis of the research. In this sense, this research was conducted to determine and compare the views of the athletes interested in individual and team sports about sleep, nutrition and habits, recovery methods and frequency of use, and these methods.

According to the results obtained from the study, 6 (5.2%) of the athletes were weak, 84 (73.1%) moderate and 25 (21.7%) Sports Recovery Knowledge Test (SRKT) according to the branch type found to have. While it was seen that team athletes were good, these values were determined as 5 (4.5%) bad, 86 (76.7%) moderate, and 21 (18.8%) good. It has been determined that the SRKT scores of individual and team athletes have "intermediate" information. It is seen that this level is not at the desired level in terms of recovery methods in individual and team athletes. One of the biggest reasons for this trend is that most of the athletes participating in the business compete at the amateur level and the services and training received by professional athletes are of higher quality and accessibility. The reason why amateur athletes do not see the sports profession as the main source of income is that they do not allocate enough interest, energy, and time to sports and rest. It is seen that the SRKT score is 53.22 in individual athletes and 54.04 in team athletes, and the numerical difference between them is not widely consumed ($p > 0.05$). The reason for this situation is that the methods after the training of individual and team athletes are the same and they are used equally.

In a study investigating the level of the Sports Recovery Knowledge Test, the recovery knowledge level of amateur and professional football players was found to be "moderate" (amateur athletes 50.58 points, professional athletes 58.44 points), and professional football players' Sports Recovery knowledge levels were found to be "moderate". Knowledge Test levels were statistically higher. ($p < 0.05$). In addition, it has been reported that the athletes mostly use the trainer channel (79% of amateur athletes and 75% of professional athletes) as the channel of access to recovery information (Aydemir & Kolayiş, 2022).

It is seen that individual and team athletes apply almost all of the recovery methods that are the subject of this research. In a study conducted on team athletes, it was stated that while the athletes used cold water immersion, contrast water therapies, and active recovery over 80%, they applied compression garments, electrical stimuli, and nutritional applications at a rate of 97% (Nedelec, Mccall, & Carling, 2013). Dupuy, Douzi, Theurot, Bosquet, and Dugué, (2018), in their systematic review, stated that massage has a significant effect on reducing delayed muscle pain up to 96 hours after exercise and is the most effective technique in reducing perceived fatigue. Increasing the use of active recovery, a technique that can be used without putting additional economic pressure on athletes should be encouraged. In addition, it is recommended that passive recovery, which is carried out without any additional procedure, be used less frequently in the light of studies that show options such as active, massage, and stretching exercises. In a study, it was concluded that the traditional recovery method accelerates the electromyographic activities of the muscles, recovery, and reduces muscle spasms. In another study, it was reported that oxygenation, hemoglobin, and myoglobin levels in the muscles were high (Koizumi, Fujita, Muramatsu, Manabe, Ito, & Nomura, 2011). In another study, it was observed that while rugby players used the hydration technique, other team players mostly used active recovery (Venter, Potgieter, & Barnard, 2009).

Foam roller, which has become increasingly popular in recent years, emerges as a material that people do with their own body weight, where pressure is used on a foam roller and on the soft tissue of the body during the movement (Cheatham & Stull, 2085). A study on football players examined the effectiveness of foam rollers in 20 minutes of FR exercises and passive recovery on the quadriceps, hamstrings, adductors, gluteals, and gastrocnemius muscles. It is recommended that soccer coaches and coaches working with senior players use a recovery protocol lasting 15 to 20 minutes based on FR exercises that can be performed at the end of a training session to increase recovery between training loads (Rey, Padrón-Cabo, Costa, & Barcala-Furelos, 2019). Wiewelhove, Döweling, Schneider, Hottenrott, Meyer, Kellmann, & Ferrauti, (2019), found in a meta-analysis study that foam rolling after training can be effective in some situations although the effects of FR on muscle function are less clear. He emphasized that it has positive effects in relieving pain and its use is preferred because it has almost no side effects.

During the massage, vasodilation in the capillaries and large vessels under the skin, that is, the expansion of the vessels, increases the blood flow rate with touch. In this sense, it is reported that massage contributes to reducing fatigue by removing waste materials that increase in the

organism following the end of short-term and intensely loaded exercises (Cambron, Dexheimer, & Swenson, 2007). In addition, in a study on delayed muscle pain, it was stated that 8 minutes of massage after exercise had no effect. He reported that a 30-minute massage performed 2 hours after the exercise had positive effects (Hilbert, Sforzo, & Swensen, 2003). Baydil et al., in a study they carried out to determine the effect of classical massage applied in total on post-exercise recovery, compared the difference between massage applied for recovery after strenuous exercises and passive rest. As a result of this comparison, it was stated that massage applied as a recovery method is a more effective method in removing lactic acid than passive rest (Baydil, Gürses, & Koç, 2017).

It was observed that nutritional, fluid, and ergogenic supports were known and used moderately in both groups. However, it is seen that the frequency of use of nutrition, fluid, and ergogenic intake of each individual and team athlete during the recovery period is still not at the desired level. As a matter of fact, taking nutritional, liquid, and ergogenic supplements, which have an important place in the healing process, can shorten the recovery period and increase its quality (Armstrong & Johnson, 2018). In a study, it was reported that chocolate milk taken after training increased the protein synthesis in the cell, decreased the pain threshold level, and increased the amount of creatine kinase (Cockburn, Hayes, & French, 2008; Nedelec, Mccall, & Carling, 2013). Muscle damage, pain, tenderness, and stiffness peak 48-72 hours after training. It is stated that non-steroidal anti-inflammatory drugs have a positive effect by lowering the pain threshold after exercise-induced muscle damage (Vaile, Gill, & Blazevich, 2007).

Cryotherapy applications are one of the most frequently used recovery and treatment methods both to accelerate recovery after heavy loads and after a trauma (injury, disability) due to their easy application and cheapness. With this method, differences occur in the intramuscular structure and joint and muscle temperature on the skin. However, some physiological responses occur, such as a decrease in heart rate and cardiac output, and increases in blood pressure and peripheral resistance (Wilcock, Cronin, & Hing, 2006). Abaidia, Lamblin, Delecroix, Leduc, Mccall, & Dupont, (2017), reported that the cold water immersion method was effective in active jumping performance in the 72nd hour after exercise, while the subjects felt less pain and perceived recovery levels were higher between 24-48 hours.

It has been reported that the use of compression garments as a recovery technique may be beneficial in the next performance power output (Glanville & Hamlin, 2012). In a study on the subject Gill, Beaven, & Cook, (2006) stated that a full-leg pressure garment used for 12 hours after the end of the race had positive effects on creatine kinase clearance and physical

recovery in elite rugby players. In a study conducted with the ultrasound method, it was reported that ultrasound treatment after intense loading reduces pain and sensitivity and indirectly increases muscle strength (Itoh, Ochi, & Kitakoji, 2008).

The age and sports history of the athletes should also be taken into account when planning exercise and rest periods. It is thought that the knowledge of recovery may be higher for the athletes who are older and older, as they have more experience with sports injuries, training, and many matches. Indeed, this study confirms this hypothesis. It is seen that the sleep, nutrition and habits, recovery methods, and frequency of use scores of the athletes aged 23 and over and those who do sports for 9 years or more are at a significant level. higher than other groups. Finally, there is no difference between the groups in terms of gender. It is seen that the frequency of use of recovery methods by male and female athletes and their opinions about it are almost equal. It is thought that this situation arises from both gender groups having equal access to information and using the same methods equally.

CONCLUSION

As a result, it can be said that the knowledge levels of individual and team athletes are almost the same according to the results of the Sports Recovery Knowledge Test applied to the athletes in this study. Knowledge levels in both groups were found to be moderate. Increasing this level with recovery training can benefit athletes. Increasing the knowledge level of athletes about recovery and using recovery techniques should be the main goals. The aim of this study is to support this argument by revealing the recovery knowledge levels of athletes. If the athlete's lack of knowledge about recovery is noticed and this deficiency is corrected, one more step can be taken in performance improvement. In addition, it has been observed that the knowledge test levels of the athletes who are older in age are better. It is important for younger athletes to perform physical recovery efficiently by providing recovery information training for their subsequent performance. In this sense, it is undoubtedly a sensitive and efficient process in terms of performance for athletes to learn these methods and increase their frequency of use, increase their knowledge about recovery, and their applications. In addition, it is recommended to determine and expand the knowledge of trainers on recovery in order to contribute to the athletes.

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REFERENCES

Abaidia, A. E., Lamblin, J., Delecroix, B., Leduc, C., Mccall, A., & Dupont, G. (2017). Recovery from exercise induced muscle damage: cold water immersion versus whole-body cryotherapy. *International Journal of Sports Physiology and Performance, 12*(3), 402-409.

Ament, W., & Verkerke, G. J. (2009). Exercise and fatigue. *Sports Medicine, 39*(5), 389-422.

Armstrong, L. E., & Johnson, E. C. (2018). Water intake, water balance, and the elusive daily water requirement. *Nutrients, 10*(12), 1928-1953.

Aydemir, M., & Kolayiş, İ. E. (2022). Futbolcuların kullandığı toparlanma teknikleri, toparlanma ile ilgili görüşleri ve toparlanma bilgi düzeylerinin incelenmesi: tanımlayıcı araştırma. *Türkiye Klinikleri Spor Bilimleri Dergisi, 14*(2), 150-159.

Aydemir, M., Mirzeoğlu, A. D., & Kolayiş, İ. E. (2020). Sporda toparlanma bilgi testi: geçerlilik ve güvenirlilik çalışması. *Türkiye Klinikleri Spor Bilimleri Dergisi, 12*(1), 40-48.

Bali, A. (2015). Psychological factors affecting sports performance. *International Journal of Physical Education, Sports and Health, 1*(6), 92-95.

Baydil, B., Gürses, V. V., & Koç, M. C. (2017). Masajın bazı toparlanma parametrelerine etkisi. *Sportif Bakış: Spor ve Eğitim Bilimleri Dergisi, 1,* 63-69.

Cambron, J. A., Dexheimer, J., & Swenson, R. (2007). Side effects of massage therapy. *The Journal of Alternative and Complementary Medicine, 13*(8), 793-796.

Cheatham, S. W., & Stull, K. R. (2018). Comparison of three different density type foam rollers on knee range of motion and pressure pain threshold: a randomized controlled trial. *International Journal of Sports Physical Therapy, 13*(3), 474-481.

Cockburn, E., Hayes, P. R., & French, D. N. (2008). Acute milkbased protein-CHO supplementation attenuates exercise-induced muscle damage. *Applied Physiology, Nutrition, and Metabolism, 33*(4), 775-783.

Dupont, G., Nedelec, M., Mccal, A., & Berthonin, S. (2015). Football recovery strategies. *Aspetar Sports Medicine Journal, 43*(4), 20-27.

Dupuy, O., Douzi, W., Theurot, D., Bosquet, L., & Dugué, B., (2018). An evidence-based approach for choosing post-exercise recovery techniques to reduce markers of muscle damage, soreness, fatigue, and inflammation: a systematic review with meta-analysis. *Frontiers in Physiology, 9*(403), 1-15.

Gill, N. D., Beaven, C. M., & Cook, C. (2006). Effectiveness of postmatch recovery strategies in rugby players. *British Journal of Sports Medicine, 40*(3), 260-263.

Glanville, K. M., & Hamlin, M. J. (2012). Positive effect of lower body compression garments on subsequent 40-kM cycling time trial performance. *Journal of Strength & Conditioning Research, 26*(2), 480-486.

Haff, G. G., & Triplett, N. T. (2015). *Essentials of strength training and conditioning.* Illinois: Human Kinetics.

Hilbert, J. E., Sforzo, G. A., & Swensen, T. (2003). The effects of massage on delayed onset muscle soreness. *British Journal of Sports Medicine, 37*(1), 72-75.

Itoh, K., Ochi, H., & Kitakoji, H. (2008). Effects of tender point acupuncture on delayed onset muscle soreness (DOMS) – a pragmatic trial. *Chinese Medicine, 3*(14), 1-5.

Kellmann, M., Bertollo, M., Bosquet, L., Brink, M., Coutts, A. J., & Duffield, R. (2018). Recovery and performance in sport: consensus statement. *International Journal of Sports Physiology and Performance, 13*(2), 240-245.

Koizumi, K., Fujita, Y., Muramatsu, S., Manabe, M., Ito, M., & Nomura, J. (2011). Active recovery effects on local oxygenation level during intensive cycling bouts. *Journal Sports, 29*(9), 919-926.

Nedelec, M., Mccall, A., & Carling, C. (2013). Recovery in soccer: part recovery strategies. *Sports Medicine, 43*(1), 9-22.

Rey, E., Padrón-Cabo, A., Costa, P. B., & Barcala-Furelos, R. (2019). Effects of foam rolling as a recovery tool in professional soccer players. *The Journal of Strength & Conditioning Research, 33(*8), 2194-2201.

Siegel, R., & Laursen, P. (2012). Keeping your cool: possible mechanisms for enhanced exercise performance in the heat with internal cooling methods. *Sports Medicine, 42*(2), 89-98.

Tessitore, A., Meeusen, R., & Cortis, C. (2007). Effects of different recovery interventions on anaerobic performances following preseason soccer training. *The Journal of Strength Conditioning Research, 21*(3), 745-750.

Vaile, J. M., Gill, N. D., & Blazevich, A. J. (2007). The effect of contrast water therapy on symptoms of delayed onset muscle soreness. *Journal of Strength & Conditioning Research, 21*(3), 697-702.

Venter, R. E., Potgieter, J. R., & Barnard, J. G. (2009). The use of recovery modalities by elite South African team athletes. *South African Journal for Research in Sport, Physical Education and Recreation, 31*(1), 133-145.

Walker, I. J., & Nordin, S. M. (2010). Performance anxiety experiences of professional ballet dancers: the importance of control. *Journal of Dance Medicine and Science, 14*(4), 133-145.

Wiewelhove, T., Döweling, A., Schneider, C., Hottenrott, L., Meyer, T., Kellmann, M., & Ferrauti, A. (2019). A meta-analysis of the effects of foam rolling on performance and recovery. *Frontiers in Physiology, 10*(376), 1-15.

Wilcock, I. M., Cronin, J. B., & Hing, W. A., (2006). Water immersion: does it enhance recovery from exercise? *International Journal of Sports Physiology and Performance, 1*(3), 195-206.