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Research Article / Araştırma Makalesi

The effect of COVID-19 pandemic on competition performances of professional orienteering athletes: An example of explanatory sequential mixed design

COVID-19 pandemisinin profesyonel oryantiring sporcularının yarışma performanslarına etkisi: Açımlayıcı sıralı karma desen örneği

Aydan Örsçelik[1], Sabriye Ercan[2]

[1]*Sports Medicine Department, Gülhane Medical Faculty, Health Sciences University, Ankara, Türkiye*
[2]*Sports Medicine Department, Faculty of Medicine, Süleyman Demirel University, Isparta, Türkiye*

ABSTRACT

Objective: This study aims to understand and reveal the impact of the COVID-19 pandemic on the competitive performance of professional orienteering athletes.

Materials and Methods: The performance changes of the athletes were analyzed in the quantitative stage according to the results of the competition. Qualitative data from the one-on-one interview method were analyzed to understand why factors were statistically significant at the quantitative stage. By evaluating the two data sets together, the study presented the effect of the COVID-19 pandemic on the performance of elite orienteering athletes with a generalizable and in-depth perspective.

Results: The number of athletes participating in the competition was low, and the rate of successful completion of the competition was high during the pandemic process. The shortening of the 'second per kilometer' duration of the elite athletes participating in the competitions held during the pandemic. In the one-on-one interview discussion with the athletes, nine main themes affecting the competition performance were found; the effect of training, nutrition change, economic impact, situations affecting overall performance, the effect of changes in competitions, psychosocial impact, the effect of health problems, motivation to continue sports and forward-looking planning.

Conclusion: Performance should be considered holistically, improvement achieved only through training would not be enough for success, athlete evaluation should also be based on economical and biopsychosocial aspects.

Keywords: *Pandemic, orienteering, performance, mixed design*

ÖZ

Amaç: Bu çalışma, COVID-19 pandemisinin profesyonel oryantiring sporcularının yarışma performansı üzerindeki etkisini anlamayı ve ortaya çıkarmayı amaçlamaktadır.

Gereç ve Yöntem: Sporcuların performans değişimleri müsabaka sonuçlarına göre nicel aşamada analiz edildi. Bire bir görüşme yönteminden elde edilen nitel veriler, faktörlerin nicel aşamada istatistiksel olarak neden anlamlı olduğunu anlamak için analiz edildi. Çalışma, iki veri setini birlikte değerlendirerek, COVID-19 pandemisinin elit oryantiring sporcularının performansı üzerindeki etkisini genelleştirilebilen ve derinlemesine bir bakış açısıyla ortaya koydu.

Bulgular: Pandemi sürecinde yarışmaya katılan sporcu sayısı az, yarışmayı başarıyla tamamlama oranı yüksekti. Pandemi sürecinde düzenlenen müsabakalara katılan elit sporcuların 'kilometre başına saniye' süreleri kısalmıştı. Sporcularla yapılan bire bir görüşmelerde müsabaka performansını etkileyen dokuz ana tema bulundu; antrenman etkisi, beslenme değişikliği, ekonomik etki, genel performansı etkileyen durumlar, müsabakalardaki değişikliklerin etkisi, psikososyal etki, sağlık sorunlarının etkisi, spora devam motivasyonu ve ileriye dönük planlama.

Sonuç: Performansın bütüncül olarak ele alınması gerektiği, sadece antrenmanla sağlanan gelişimin başarı için yeterli olmayacağı, sporcunun ekonomik ve biyopsikososyal açıdan değerlendirilmesi gerektiği açımlanmıştır.

Anahtar Sözcükler: *Pandemi, oryantiring, performans, karma desen*

INTRODUCTION

Orienteering is a sport that developed in the Scandinavian region and spread rapidly worldwide (1). It is performed in all age groups as it is known to be beneficial in many subjects, such as increasing map knowledge, physical performance, sociability, fun, team spirit development and problem-solving skills (2–4). It is a different sports branch that includes reaching the marked points on the terrain following the order shown by choosing the fastest map route and combining physical strength and intelligence in this aspect (2,3). In the orienteering sports branch, physical ca–

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Correspondence / Yazışma: Aydan Orscelik · SBÜ. Gülhane Tıp Fakültesi, Spor Hekimliği Bölümü, Ankara, Türkiye · aydanozcan@yahoo.com

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pacity parameters such as strength and endurance and behavioral and cognitive capacity parameters are important in performance (5–7).However, for the same reason, it is reported that having a high level of map reading knowledge and skill can provide an advantage over physical performance (5).

The coronavirus (COVID-19) is the reason for the pandemic that caused respiratory diseases and acute respiratory syndrome that emerged in March 2020. In order to reduce the spread of the pandemic and prevent people from being exposed to the virus at the beginning of the emerging pandemic, various authorities were advised to stay at home, and it caused restrictions in a wide variety of areas, including sporting events all over the world (8–10). With the decrease in the number of cases, measures were determined, and competitions started to be held, first without and then with the audience subsequently period during the pandemic. However, the restriction of outdoor activities has caused changes in the daily routine activities of individuals, including regular physical activity and exercise. In particular, the limitations experienced by professional athletes in performing their routine training programs could cause various levels of loss in their sportive performance during this period (9) because conditions such as training loss or illness can affect the athlete's performance (11). In addition, neuropsychological symptoms such as memory loss and slow thinking are also defined as a prolonged finding of the COVID-19 disease (12). This situation may also affect the cognitive capacities of orienteering athletes.

It is reported that the athletes competing in the orienteering sports discipline, which is an outdoor sport and provides both physical and mental gains, showed lower performance in the races they participated in during the pandemic compared to the pre-pandemic period in a quantitative research design study (13). Evaluating and analyzing only the quantitative aspects of the themes in the literature has various limitations compared to the current approach. Only quantitative evaluation provides generalization, but it does not enable the problem to be explored in depth. For this reason, mixed-method research is gaining popularity in the field of sports medicine in order to overcome the limitations of quantitative research (14).

This explanatory sequential mixed design study aims to explain the factors underlying the emergence of quantitative findings and determining the effect on the performance of elite orienteering athletes during the COVID-19 pandemic.

MATERIAL and METHODS

Research design

This is an exploratory sequential mixed-design study. The study was approved by the local ethics committee's decision dated 25/5/2022 and numbered 58/6. The consent of the athletes who were interviewed was obtained.

First of all, the performance changes of the athletes were analyzed in the quantitative stage according to the results of the competition. Qualitative data from the one-on-one interview method were analyzed to understand why factors were statistically significant at the quantitative stage. Then, by evaluating the two data sets together, it was aimed to present the effect of the COVID-19 pandemic on the performance of elite orienteering athletes with both a generalizable and in-depth perspective. The research process can be symbolized as QUAN⇢qual (15). The research process is illustrated in Figure 1.

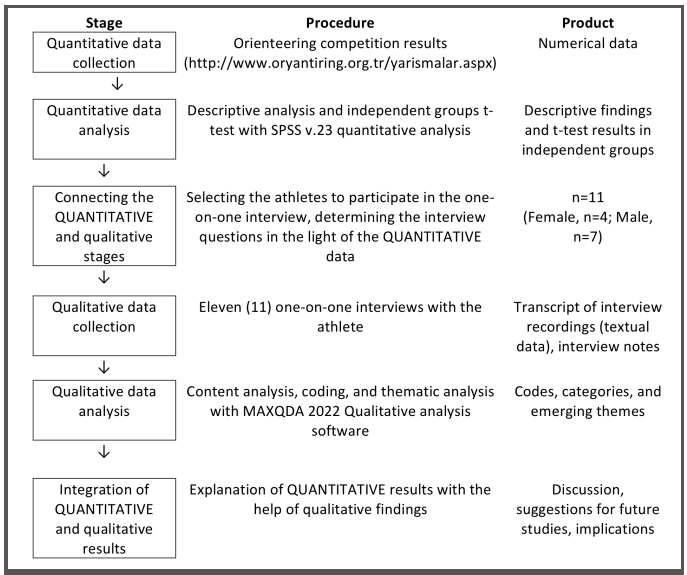

Figure 1. Diagram of explanatory sequential mixed design of this study

Quantitative assessment

The results of the competition, which are available to the public on the official website of the Turkish Orienteering Federation, were examined. The results of the national competitions organized by the Federation in the 2018-2019, 2019-2020 and 2020-2021 seasons and in which athletes over 18 participated, were evaluated.

In this context, the results of the 1st stage foot orienteering competition, 2nd stage foot orienteering competition, Türkiye foot orienteering championship, Türkiye Mountain bike orienteering championship and Türkiye ski orienteering championship of the elite female (F21) and elite male (M21) age categories were used as quantitative data to evaluate the performance of professional athletes. The results were analyzed by classifying them as pre-pandemic and after the onset of the pandemic, according to March 2020, which is

accepted as the start date of the pandemic in our country (Table 1).

Table 1. Competitions in which the Performance of Athletes is evaluated

	BP-2	BP-1		AP+1	AP+2
1. stage foot OC	2018-2019 season (October 2018)	2019-2020 season (October 2019)	The Beginning of the Pandemic in Türkiye (March 2020)	2020-2021 season (November 2020)	-
2. stage foot OC	2018-2019 season (March 2019)	2019-2020 season (November 2019)		2020-2021 season (March 2021)	-
TR foot OCh	-	2018-2019 season (April 2019)		2020-2021 season (July 2021)	-
TR mountain bike OCh	-	2018-2019 season (May 2019)		2019-2020 season (August 2020)	2020-2021 season (June 2021)
TR ski OCh	2018-2019 season (January 2019)	2019-2020 season (January 2020)		2020-2021 season (January 2021)	-

BP-1: First competition before the pandemic, BP-2: Second competition before the pandemic, AP+1: First competition after the onset of the pandemic, AP+2: Second competition after the onset of the pandemic, TR: Türkiye, OC: orienteering competition, OCh: orienteering championship

The competitions examined were also categorized as short, medium, or long-distance individual competitions according to the distance of the competition track. The 'second per kilometer' time of the competitors was calculated by dividing the finishing time (sec) by the track distance (km). Numerical results were analyzed with descriptive analysis and independent samples t-test using SPSS v.23 programs.

Qualitative assessment

In order to understand the impact of the COVID-19 pandemic on the competitive performance of professional orienteering athletes, one-on-one interviews were held with the competitors in the M21 and F21 age categories.

The one-on-one interviews were conducted by recording audio by phone. After the one-on-one interviews, the audio recordings were transcribed word for word and then subjected to thematic analysis with the MAXQDA Analytics Pro 2022 (Release 22.4.0) program (VERBI Software GmbH; Berlin, Germany) by the researcher, whose blindness was preserved about the athletes. The research results were presented following the mixed method methodology.

RESULTS

Quantitative Results

Although the number of athletes participating in the competitions was higher before the pandemic, the rate of successful completion of the competition remained lower, according to the analysis. The number of athletes participating in the competition was low, and the successful completion rate was high during the pandemic process (Table 2). On the other hand, the shortening of the 'second per kilometer' duration of the elite athletes participating in the competitions held during the pandemic process, in other words, the improvement in their performance is striking. This effect on performance created a statistically significant difference, especially in elite male athletes (Table 3-4).

Table 2. The total number of athletes participating in the competition (n) and the rate of successful completion of the competition (%)

	BP-2	BP-1	AP+1	AP+2
1. stage foot OC				
Short dist. (M/F)	-	n=117, 73.5% / n=55, 67.3%	-	-
Medium dist. (M/F)	n=58, 82.8% / n=28, 67.9%	n=117, 84.6% / n=55, 76.4%	n=52, 94.2% / n=20, 95%	-
Long dist. (M/F)	n=58, 79.3% / n=28, 71.4%	-	n=52, 84.6% / n=20, 85%	-
2. stage foot OC				
Short dist. (M/F)	n=132, 75% / n=72, 62.5%	n=103, 85.4% / n=55, 72.7%	n=63, 7%3 / n=25, 88%	-
Medium dist. (M/F)	n=132, 74.2% / n=72, 65.3%	-	n=63, 81% / n=25, 76%	-
Long dist. (M/F)	-	n=103, 40.8% / n=55, 25.5%	-	-
TR foot OCh				
Short dist. (M/F)	-	n=125, 84% / n=63, 65.1%	n=41, 92.7% / n=13, 84.6%	-
Medium dist. (M/F)	-	n=125, 72.8% / n=63, 47.6%	n=41, 90.2% / n=13, 92.3%	-
Long dist. (M/F)	-	n=125, 68.8% / n=63, 49.2%	n=41, 82.9% / n=13, 84.6%	-
TR mountain bike OCh				
Medium dist. (M/F)	-	n=28, 60.7% / n=16, 37. %5	n=10, 60% / n=5, 60%	n=12, 83.3% / n=7, 71. %4
Long dist. (M/F)	-	n=28, 53.6% / n=16, 37.5%	n=10, 90% / n=5, 60%	n=12, 66.7% / n=7, 42.9%
TR ski OCh				
Medium dist. (M/F)	n=16, 75% / n=16, 50%	-	n=10, 30% / n=9, 55.6%	-
Long dist. (M/F)	n=16, 81.3% / n=16, 62.5%	n=15, 60% / n=8, 37.5%	n=10, 70% / n=9, 44.4%	-

BP-1: First competition before the pandemic, BP-2: Second competition before the pandemic, AP+1: First competition after the onset of the pandemic, AP+2: Second competition after the onset of the pandemic, dist.: distance, TR: Türkiye, OC: orienteering competition, OCh: orienteering championship, M: Male, F: Female. n: Total number of athletes participating in the competition, %: Percentage of athletes who completed the competition without problems (without starting, not finishing, timeout, target skipping, elimination, etc.).

Table 3. Elite male (M21) athletes' "second per kilometer" time

	BP-2	BP-1	AP+1	AP+2	P value
1. stage foot OC (sec/km)					
Short dist.	-	365.52±98.86	-	-	-
Medium dist.	698.02±203.81 [c]	1114.20±423.61 [b]	869.46±251.54 [a]	-	[(a-b)]: 0.0001* [(a-c)]: 0.0001*
Long dist.	626.89±203.01	-	585.07±116.70	-	0.237
2. stage foot OC (sec/km)					
Short dist.	422.79±152.80 [c]	364.07±68.78 [b]	340.32±60.68 [a]	-	[(a-b)]: 0.051 [(a-c)]: 0.0001*
Medium dist.	738.83±319.76	-	715.67±209.56	-	0.597
Long dist.	-	803.78±172.29	-	-	-
TR foot OCh (sec/km)					
Short dist.	-	372.57±149.68	389.44±130.99	-	0.543
Medium dist.	-	903.22±370.63	733.53±219.24	-	0.003*
Long dist.	-	707.83±193.79	639.09±113.76	-	0.023*
TR mountain bike OCh (sec/km)					
Medium dist.	-	616.90±185.37 [c]	507.88±131.71 [b]	573.27±185.47 [a]	[(a-b)]: 0.464 [(a-c)]: 0.560 [(b-c)]: 0.201
Long dist.	-	639.40±192.76 [c]	449.57±79.30 [b]	445.76±61.06 [a]	[(a-b)]: 0.914 [(a-c)]: 0.002* [(b-c)]: 0.003*
TR ski OCh (sec/km)					
Medium dist.	619.47±111.49	-	548.86±117.72	-	0.349
Long dist.	716.78±199.58 [c]	930.78±247.47 [b]	540.88±105.19 [a]	-	[(a-b)]: 0.001* [(a-c)]: 0.045*

BP-1: First competition before the pandemic, BP-2: Second competition before the pandemic, AP+1: First competition after the onset of the pandemic, AP+2: Second competition after the onset of the pandemic, dist.: distance, TR: Türkiye, OC: orienteering competition, OCh: orienteering championship.

Note: Results are presented as 'mean±standard deviation'. *: According to the t-test result in independent groups, the p-value is significant below 0.05. [(a-b)], [(a-c)], [(b-c)]: p-value resulting from difference analysis between groups.

Table 4. Elite female (F21) athletes' "second per kilometer" time

	BP-2	BP-1	AP+1	AP+2	P value
1. stage foot OC (sec/km)					
Short dist.	-	470.52±139.80	-	-	-
Medium dist.	1005.31±259.03 [c]	1513.81±557.81 [b]	976.34±279.81 [a]	-	[(a-b)]: 0.0001* [(a-c)]: 0.746
Long dist.	1020.66±245.78	-	779.12±173.96	-	0.002*
2. stage foot OC (sec/km)					
Short dist.	532.47±154.39 [c]	463.24±118.63 [b]	456.55±147.31 [a]	-	[(a-b)]: 0.846 [(a-c)]: 0.059
Medium dist.	914.82±370.80	-	901.82±205.10	-	0.886
Long dist.	-	1006.69±187.35	-	-	-
TR foot OCh (sec/km)					
Short dist.	-	505.47±186.18	403.26±101.54	-	0.103
Medium dist.	-	1092.78±292.34	959.19±229.79	-	0.168
Long dist.	-	917.13±193.49	796.30±187.73	-	0.081
TR mountain bike OCh (sec/km)					
Medium dist.	-	984.08±223.41 [c]	653.27±114.82 [b]	925.34±356.11 [a]	[(a-b)]: 0.258 [(a-c)]: 0.746 [(b-c)]: 0.051
Long dist.	-	821.42±157.15 [c]	632.02±100.14 [b]	827.16±262.75 [a]	[(a-b)]: 0.296 [(a-c)]: 0.968 [(b-c)]: 0.104
TR ski OCh (sec/km)					
Medium dist.	1130.19±135.82	-	774.67±157.79	-	0.001*
Long dist.	1207.66±173.92 [c]	1372.60±93.01 [b]	1079.57±232.68 [a]	-	[(a-b)]: 0.099 [(a-c)]: 0.278

BP-1: First competition before the pandemic, BP-2: Second competition before the pandemic, AP+1: First competition after the onset of the pandemic, AP+2: Second competition after the onset of the pandemic, dist.: distance, TR: Türkiye, OC: orienteering competition, OCh: orienteering championship.

Note: Results are presented as 'mean±standard deviation'. *: According to the t-test result in independent groups, the p-value is significant below 0.05. [(a-b)], [(a-c)], [(b-c)]: p-value resulting from difference analysis between groups.

Qualitative Results

The characteristics of the athletes are presented in Table 5. In the one-on-one interview with the athletes, nine (9) main themes affecting the competition performance were found (Table 6). These are the effect of training, nutrition change, economic impact, situations affecting overall performance, changes in competitions, psychosocial impact, health problems, motivation to continue sports and forward-looking planning.

Table 5. Characteristics of the athletes

Athlete	Gender	Age	BMI	Sports participation (year)	Training (hour/week)	Discipline	COVID-19
A 01	M	28	20.2	14	15	Foot, MTB, Ski	-
A 02	F	25	19.4	13	9	Foot	+
A 03	F	23	18	10	12	Foot	+
A 04	M	32	23.7	18	20	Foot, MTB, Ski	-
A 05	M	37	18.6	18	12	Foot	+ (2)
A 06	M	36	23.8	18	12	Foot, MTB	+
A 07	F	29	18.7	11	6	Foot	-
A 08	M	27	21.9	12	6	Foot	-
A 09	F	25	17.9	10	5	Foot	+
A 10	M	41	22	21	10	Foot, Ski	-
A 11	M	34	23.4	17	8	Foot	-

M: Male, F: Female, BMI: body mass index, Foot: Foot orienteering, MTB: Mountain bike orienteering, Ski: Ski orienteering, (n): number of COVID (+).

Table 6. Themes of the athletes

Athlete	Effect of Training	Nutrition Change	Economic Impact	Situations Affecting Overall Performance	Effect of Changes in Competitions	Psychosocial Impact	Effect of Health Problems	Motivation to Continue Sports	Forward-Looking Planning
A 01	■ (1)	■ (1)	■ (1)	■ (4)	■ (5)	■ (4)	■ (2)	■ (1)	■ (2)
A 02	■ (13)	■ (1)	■ (5)	■ (2)	■ (6)	■ (4)	■ (5)	■ (3)	■ (3)
A 03	■ (5)	■ (1)	■ (2)	■ (5)	■ (4)	■ (2)	■ (4)	■ (1)	■ (1)
A 04	■ (13)	■ (7)	■ (1)	■ (10)	■ (14)	■ (4)	■ (8)	■ (1)	■ (2)
A 05	■ (7)	■ (1)	■ (1)	■ (6)	■ (7)	■ (2)	■ (6)	■ (3)	■ (2)
A 06	■ (8)	■ (1)	■ (4)	■ (6)	■ (11)	■ (1)	x	■ (1)	■ (2)
A 07	■ (7)	x	■ (2)	■ (3)	■ (5)	■ (2)	■ (5)	■ (2)	■ (1)
A 08	■ (10)	■ (1)	■ (5)	■ (2)	■ (5)	■ (4)	x	■ (2)	■ (2)
A 09	■ (7)	■ (2)	■ (2)	■ (3)	■ (5)	■ (1)	x	■ (3)	x
A 10	■ (7)	■ (8)	■ (2)	■ (1)	■ (8)	■ (2)	x	■ (4)	■ (6)
A 11	■ (5)	x	■ (2)	■ (2)	■ (6)	■ (1)	■ (2)	■ (2)	■ (5)

■: It expresses that coding has been done to the theme. x: It states that there is no coding of the related theme. (n): number of encodings.

1. Effect of Training

The effect of training has been one of the main themes expressed by all athletes. When the sub-themes of this main theme were examined, it was noticed that athletes were affected in different dimensions in terms of training during the pandemic. In this context, the sub-theme that the athletes are affected by individually has been the main basis that affects the competition performance.

63.64% (n=7) of the athletes stated that there was a change in the type of training.

> "Of course, there was a difference in terms of running. My running level improved, but in orienteering, there was a regression or a pause as I tended to run more" [A-03; Position: 45 - 45].

> "We could not do high-intensity training, we could not do the training with the group or the activities we would do under the control of the coaches, so we always did individual trials" [A-11; Position: 24 - 24].

54.55% (n=6) of the athletes stated that there was a change in the training pattern.

> "For a while, I had a spike in training. Then it went down a lot. It destabilized it a bit. It took me out of a certain routine." [A-07; Position: 48 - 48]

> "For example, if I had an hour at work, I could run for an hour. I could run for half an hour if I had half an hour. That day, if I had ample time, I tried to run long." [A-04; Position: 74 - 74].

The statements of those who reported that they were positively affected by the privileges provided to athletes (54.55% (n=6)) are as follows.

> "Since my environment was an athlete, athletes started to emerge gradually. Special permissions were given to national athletes" [A-05; Position: 100 - 100].

> "I cannot say for the first three months, but after the first three months, I was more isolated, doing the training comfortably, using the facilities, and I was able to run very comfortably outside; I could not run comfortably because the streets were too crowded before" [A-02; Position: 58 - 58].

The statements of those who reported that the training was affected due to restrictions (45.45% (n=5)) were in the opposite direction.

> "You have to run on different terrain, and travel bans have had a bad effect on not being able to go, just staying in the same area." [A-08; Position: 28 - 28].

On the other hand, 27.27% (n=3) of the athletes reported that they experienced a decrease in training due to a health/sports injury suffered during the pandemic, and 18.18% (n=2) due to loss of motivation. Considering all the effects on training, 45.45% (n=5) of the athletes reported a decrease in training, while 36.36% (n=4) said they experienced an increase in training.

2. Nutrition Change

The main theme for nutrition 'to be healthy/nutrition aimed at protecting the immune system (27.27% (n=3))' and 'unhealthy eating behavior (63.64% -(n=7))', two sub-themes are collected. Sample statements in this context are set out below.

> "I was not paying attention to this before in nutrition, and I was not paying attention to things that would strengthen the immune system. ..... I used extra immune-boosting food, whatever it was, pills, immune-enhancing medicines, etc." [A-04; Position: 48 - 48]

> "I am bored; now there is no enthusiasm, no race, you just want to keep your form, what are you doing, you are bored at least, you can remember from there, making bread, making pita bread or something" [A-10; Position: 55 - 55].

3. Economic Impact

The economic impact dimension experienced during the pandemic has also created dimensions that will show a relationship with sports performance. For example, during the pandemic period, it became difficult for individuals who experienced a negative economic impact (45.45%, n=5) to access training materials and competitions. However, individuals (63.64%, n= 7) whose economic conditions did not shift to a negative dimension due to family support, sponsor support, or fixed income showed an increase in their sporting performance.

> "I can say that the economic evil brought by COVID-19, while buying a material or buying a supplement, in that sense, it has a negative effect." [A-08; Position: 34 - 34].

> "Normally it affected badly, I hardly found a funder to go to the competitions" [A-02; Position: 68 - 68]

4. Situations Affecting Overall Performance

It has been determined that the situations affecting the overall performance can also be categorized as loss (such as performance impairment due to illness/ sports injury (27.27%, n=3), performance loss due to organization-federation (36.36%, n=4), general performance loss (45.45%, n=5)) and gain (overall performance gain (36.36%, n=4) and differentiation/change of sporting characteristics/performance (18.18%, n=2)). In this context, the impact aspect of the overall performance was also reflected in the competition performance.

> "I worked for six months, and then this prevented me. When I returned to Ankara, I was treated" [A-01; Position: 47 - 47], "Conversion was good" [A-01; Position: 62 - 62].

> "Our only problem was that the athletes cannot see ahead; you are training, you are always fit, so the race date is not certain, nothing is certain..." [A-06; Position: 74 - 74].

> "For me, that was one of my best seasons; I actually developed myself" [A-02; Position: 54 - 54].

> "My map reading skill and my running pace were different from each other. That is why I felt regressed. In terms of running, yes, I can say it increased, but it affected my orienteering skills." [A-03; Position: 47 - 47].

5. Effect of Changes in Competitions

Athletes have stated that there were apparent changes in competitions held during the pandemic. They were divided into sub-themes such as inability to participate in the competition for economic reasons (45.45%, n=5), inability to participate in the competition for psychosocial reasons (81.82%, n=9), uncertainty/change of the competition calendar/parkour (54.55%, n=6), and change in participation by age groups and categories (100%, n=11). The change in participation according to the age groups and categories mentioned by all athletes pointed out the decrease in the number of participants presented in quantitative data and the increase in race completion rates.

> "In the competitions, we would normally have around 1000 participants. Due to the pandemic, there was less than 50% participation in the 400s. It fell below 50%." [A-04; Position: 130 - 130], "The quality has also deteriorated." [A-04; Position: 134 - 134], "Because the team that left the race did not come, so finisher may even have increased" [A-04; Position: 146 - 146]

> "People who are success-oriented or internalized this job continue, but as you said, those other mostly volunteer amateurs got lost, so they left or were left out" [A-11; Position: 88 - 88]

6. Psychosocial Impact

Although orienteering is an individual sports discipline, psychological (45.45%, n=5) and social (100%, n=11) effects were considered to influence athletes' performance. Mainly, the athletes approaching the upper age limit in the elite category were affected by the temporal loss in the pandemic process.

> "I was not affected psychologically very seriously, but there were times when I thought about what the races would be like. There were times where our sports life would go. I think it is because of age. At that time, I thought I could be an elite athlete for one or two more years, so I wanted to do one or two more. So, if I were maybe twenty years old, I would not mind too much." [A-05; Position: 38 - 38]

> "I was socially impressed. Because orienteers' social environment consists mostly of the sports environment, race environment, or what we know when we go abroad. Of course, all the races were canceled for a while. We could not meet with most people during this cancellation period; of course, it negatively affected us socially. Oh, of course, with COVID-19, we have tried to integrate more, with zoom meetings at work or online classes or meetings, but it was not as strong as face-to-face, but it rescued a bit." [A-08; Position: 78 - 78]

7. Effect of Health Problems

It was determined that various health problems developed in athletes under two main headings, namely sports injury that developed during the pandemic (45.45%, n=5) and COVID-related or vaccination-related effect (27.27%, n=3). When the impact of health problems on competition performance was examined in depth, it was determined that pandemic-induced restrictions on access to health services (36.36%, n=4) had an impact and that there might be delays in the implementation of health services in this context. For this reason, there might be a negative impact on athletes' training programs.

> "There was no sports medicine. I could not go to a distant city to show it then." [A-05; Position: 68 - 68], "Everywhere was forbidden at that time. Transportation was forbidden." [A-05; Position: 70 - 70], "The health care I received before the pandemic was not different from the health care I received afterward when I went to the physician I wanted." [A-05; Position: 74 - 74]

> "After the vaccinations, my heart rate started to deteriorate for a while, so I lowered the training intensity. So, it took me like two months." [A-07; Position: 54 - 54]

On the other hand, athletes injured during the pandemic were protected from falling behind in the league or competition rankings because competitions were postponed due to restrictions. According to this point of view, the pandemic allowed the athletes (18.18%, n=2) to gain time to return to sports and improve their performance.

> "Due to the cervical disc hernia during the pandemic, even if there were no pandemic, I would have had to cut my training... The pandemic process prevented me from staying at

> the background in the competitions" [A-01; Position: 26 - 26]

8. Motivation to Continue Sports

It has been observed that the motivation to achieve the goal, especially in athletes who have achieved gains in their sports performance (63.64%, n=7), constituted a serious source of motivation to continue sports during the pandemic.

> "I never thought of quitting the sport anyway, and I had goals" [A-05; Position: 82 - 82]

I said, "This is going to end eventually," and I wanted to be ready for the next. I did not want to see myself at a very low level when it was over. [A-09; Position: 64 - 64]

In addition to the goals, athletes who continue to play sports to overcome psychosocial and health problems (63.64%, n=7) were also existed.

> "As my cervical disc hernia is getting better day by day, it has been a pleasure and a new training in the recovery process" [A-01; Position: 55 - 55].

> "We are mostly at home all day, we are bored with time, going to the training decrease a little more stress, at least getting away from that environment at home, getting fresh air, and feeling that I protect my health more" [A-02; Position: 49 - 49]

9. Forward-Looking Planning

When we examined the themes revealed in the qualitative analysis of one-on-one interviews with athletes, it was found that athletes who plan and feel strongly motivated to carry out these plans recovered from the adverse effects of the pandemic relatively quickly and hold on to sports.

DISCUSSION

In 2020, the beginning of the COVID-19 pandemic, restrictions were made in all areas and worldwide to prevent the spread and protect society. Restrictions, inability to train, infection, quarantine processes, canceled organizations, and competitions may have affected the athletes physically and psychologically. Accordingly, the expectation was a decrease in the performance of the athletes, but the results were not very consistent. Although the number of athletes participating in the competitions was lower during the pandemic, the rate of successful completion of the competition was high. The improvement in their performance was remarkable, especially in elite male athletes. The one-on-one interview with the athletes revealed that the main themes discussed below affected the competitive performance.

1. Effect of Training

It has been reported that the necessity of home exercise instead of outdoor or sports centers during the restriction at the beginning of the pandemic reduced cardiovascular endurance, and supposed that home exercises were not sufficient for athletes (16). Karrer et al. evaluated elite athletes' training, performance, and physical and mental health during the Swiss quarantine period and the following 6-month period. They reported that stricter COVID-19 restrictions had been associated with decreased subjective sports performance and lower training intensity, and sports performance and training load increased again in the progressive period (17). Mon-López et al. showed that the duration of COVID-19 isolation in Spanish football players reduced the training load (training time and intensity) ($p < 0.01$) (18). Similarly, in our study, more than half of the athletes changed their training type and pattern modification due to the severe restrictions experienced at the beginning of the pandemic. Almost half of the athletes (45.4%) reported a reduction in their training during the pandemic.

On the other hand, 36.3% of the athletes stated that they increased training. Orscelik et al. reported that 57.9% of volleyball players thought their sports performance decreased, 10.5% increased, and 31.6% had no change (9). 54.5% of the participants thought that training has been positively affected in the progressive period since the outdoor activities were allowed.

2. Nutrition Change

It was anticipated that nutritional intervention could be a strategy to reduce potential performance losses against training/competition restrictions and a supporter of immune function during the pandemic (19). A review of the nutritional effects of the COVID-19 pandemic during the restriction reported how unhealthy dietary changes were encouraged. The eating habits of the countries vary according to the culture and the duration of the lockdown at home. The negative emotions increase unhealthy eating habits. Clemente-Suárez et al. stated that fear of the pandemic might be the source of unhealthy nutrition (20). Two-thirds of the participants (63.64%) were gathered under the title of 'unhealthy eating behavior', and one-third (27.2%) “protecting the immune system” in this study.

3. Economic Impact

The economic situation has been regarded to have negative impact on sports performance during the pandemic. Athletes (45.4%) whose economic conditions were negatively af-

fected during the pandemic had difficulty in accessing educational materials and participating in competitions. On the other hand, an increase in sports performance has been reported by the athletes (63.6%) who were not economically affected.

4. Situations Affecting Overall Performance

Minoiu et al. determined an approximately 40% decrease in the number of Romanian national orienteering athletes 2021 competitions, compared to 2019. The second/kilometer value of the senior athletes was slightly better in 2021 (13). Similar to these results, the number of athletes decreased during the pandemic and elite athletes' second/kilometer value improved in this study. Orscelik et al. found that jump height, accepted as the most valuable measurement in evaluating volleyball performance, did not change, even increasing at every measurement after COVID-19 in volleyball athletes. The authors conducted the study after the leagues started again and reported that inactivity may be more harmful than illness on sports performance (9). Minoiu et al. stated that orienteering athletes improved their physical performance in 2020. Orienteering is not a sport that requires only physical performance. Map reading and acting with these technical details are also important as at least physical performance. While orienteers improved their physical performance, their technical performance decreased at the pandemic's beginning (13). Similar to these studies, the situations affecting the overall performance are categorized as loss and gain in this study. Some athletes were found to have increased performance while some have decreased.

5. Effect of Changes in Competitions

Minoiu et al.'s trial is the only study about the impact of the pandemic on orienteering athletes. Minoiu et al. reported that the number of athletes decreased due to the inability to participate in the competition for psychosocial reasons and cancellation of the competitions (13). Similarly, and in addition to this, uncertainty/change of the competition calendar/parkour and inability to participate in the competition for economic reasons were the other causes identified in our study. Interestingly, all the participants stated the change in participation according to the age groups and categories, which concluded as a decreased number of competitors and increased race completion rates.

6. Psychosocial Impact

Orienteering sport is known for its social and familiar atmosphere (7). A study reported that more psychological well-being was seen in athletes who frequently interacted with team members and thought to be supported (21). Brown et al. showed the effect of psychological and psychosocial interventions on sports performance (22). Sports performance has been found to improve by using mindfulness practices (23). In this study, all the participants reported that they were influenced socially, whereas, nearly half of them claimed to be effected psychologically in terms of sports performance loss. Elite senior athletes reported fear of decreased performance and loss of chance to be national athlete again.

7. Effect of Health Problems

Sports injury prevention strategies have been considered to eliminate the problems developed by the pandemic with respect to sports branches. Thron et al.'s study reported that 3 to 5 substitutions per game during a match might protect players from injury (24). Stokes et al. thought that the athletes might also need psychological support due to isolation, changing training style/time, and uncertainties in every subject during the pandemic. Also, COVID-19 poses a risk for myocarditis and cardiac arrhythmias (19). Similar to these considerations, this study found various health problems developed in athletes as sports injuries that developed during the pandemic (45.4%) and had COVID- or vaccination-related effects (27.2%). Another problem was pandemic-related restrictions on access to health services (36.3%). This may be caused delays in implementing health services and negatively impact athletes' training programs.

An unexpected situation was experienced by the athletes who lost their training or missed the competitions due to injury during the lockdown. These athletes (18.1%) were protected from falling behind in the league or competition rankings and also gained time to return to sports and improve their performance until the league or competitions started again.

8. Motivation to Continue Sports

The task of emotional intelligence is to recognize one's own and other people's feelings and use them to guide ideas and actions. For this reason, emotional intelligence is considered a probable oracle for evaluating sports performance in the sports medicine approach. Higher emotional intelligence values were more associated with motivation for training. Castro-Sánchez et al.'s study reported that an athlete's mood could determine performance (18). It was evaluated that the motivation to reach the goal was higher in athletes who increased their sports performance (63.6%) in this study. In addition, athletes (63.6%) continue to train to get over their psychosocial and health problems.

9. Forward-Looking Planning

Athletes who had plan for future were more motivated. Motivated athletes were less affected by the adverse effects of the pandemic by holding on to sports.

CONCLUSION

When the quantitative and qualitative results were examined and integrated, there were positive progress of the competition results and the increase in the completion rates of the competition in the elite athlete category during the pandemic period. Performance should be considered holistically; training is not solely important to improve athletic performance, biopsychosocial factors should also be taken into consideration as well.

Ethics Committee Approval / Etik Komite Onayı

The approval for this study was obtained from Süleyman Demirel University Ethics Committee, Isparta, Türkiye (Decision no: 58/6 Date: 25.05.2022).

Conflict of Interest / Çıkar Çatışması

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