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PAGES: 706-723

ORIGINAL PDF URL: https://dergipark.org.tr/tr/download/article-file/4238420

Motivational Factors for Running an Ultramarathon as a Recreational Activity

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Abstract

Although runners mostly start for health benefits and recreational purposes, there is a shift in the recent years from half-marathon to ultramarathon (UM) running that pushes the physiological and mental limits of human body. The aim of this study was to investigate the factors for motivation of recreational runners competing in the 119 km Cappadocia Ultramarathon Run. Data of 98 endurance runners was collected via The Ultra Marathon Motivation Scale (UMMS) and analyzed according to the independent variables gender, age, marital status, education level, weekly training frequency and running distance. Results of the study showed that the factors that motivate recreational runners, especially those over the age of 45, more likely to run UM are self-esteem, affiliation, personal goal achievement, health orientation, life meaning and competition with oneself. Moreover, it has been understood that the reason that motivates male runners to participate in UM runs more than female runners is the feeling of competition with other runners, and as the education level of runners increases, weight concern is the most effective factor in motivating them. However, it was determined that the runners' marital status, weekly training frequency and running distance did not have any effect on their motivation to participate in UM runs. It can be concluded that the motivation of recreational runners to participate in UM runs differed according to their age, gender and educational status. Since UM running is not considered a single sporting event and has various forms that vary depending on distance or time, it is of great importance to examine the motivational factors in several UM events with different characteristics.

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Rekreatif Amaçlı Bir Aktivite Olarak Ultramaraton Koşmaya Yönelik Motivasyon Faktörleri

Öz

Sağlık üzerinde olumlu etkileri nedeniyle eğlence amaçlı başlanan koşuların son yıllarda yarı maraton mesafelerinden fizyolojik ve zihinsel sınırlarını zorlayan ultramaraton (UM) koşusuna doğru bir geçiş sergilediği görülmektedir. Bu çalışmanın amacı, 119 km'lik Kapadokya Ultramaratonunda yarışan eğlence amaçlı koşucuların motivasyon faktörlerini araştırmaktır. 98 dayanıklılık koşucusunun verileri Ultra Maraton Motivasyon Ölçeği (UMMS) ile toplanmış ve cinsiyet, yaş, medeni durum, eğitim düzeyi, haftalık antrenman sıklığı ve koşu mesafesi bağımsız değişkenlerine göre analiz edilmiştir. Çalışmanın sonuçları, özellikle 45 yaş üstü rekreatif amaçlı koşan sporcuları UM koşmaya motive eden faktörlerin öz saygı, bağlılık, kişisel hedef başarısı, sağlık yönelimi, yaşam anlamı ve kendisiyle rekabet olduğunu göstermiştir. Ayrıca erkek koşucuları kadın koşuculara göre UM koşularına daha fazla katılmaya motive eden nedenin diğer koşucularla rekabet duygusu olduğu, koşucuların eğitim düzeyi arttıkça kilo kaygısının onları motive etmede en etkili faktör olduğu anlaşılmıştır. Ancak koşucuların medeni durumlarının, haftalık antrenman sıklıklarının ve koşu mesafelerinin UM koşularına katılma motivasyonları üzerinde bir etkisi olmadığı belirlenmiştir. Sonuç olarak UM koşularına katılan rekreasyonel koşucuların katılım motivasyonlarının yaş, cinsiyet ve eğitim durumuna göre farklılık gösterdiği anlaşılmıştır. UM koşusu tek bir spor etkinliği olarak düşünülmemelidir, zira mesafeye veya zamana bağlı olarak değişen çeşitli formları bulunmaktadır. Bu nedenle gelecekteki çalışmalarda farklı UM etkinliklerine katılan rekreasyonel koşucuları motive eden faktörlerin ayrı ayrı incelenmesi önem taşımaktadır.

Anahtar kelimeler: Ultramaraton, Motivasyon, Koşu, Rekreasyonel Aktivite, Cinsiyet.

Introduction

Running is the most popular physical activity because it is simple, does not require any equipment and can be performed everywhere. The history of running starts in the ancient times, when humankind was running for survival and hunting, better said, they run for their lives (Anderson, 1985). Throughout the history, running was accepted initially as a competitive sport in athletics (Bale, 2004), while running for recreational purpose on streets was considered an odd activity until the 1960s (Goffman, 1971). Stokvis (2006), stated that running for recreational purpose was perceived as breaking social rules and disrupting public order among pedestrians, and was recognized as done by people who in hurry in public area (Paunonen, 2004). Because running in public was seen as a waste of energy, people who engaged in running activities in their leisure were ridiculed, thus, recreational running was a highly unusual physical activity for most of the twentieth century (Van Bottenburg et al., 2010). In 1970's, even the American President Jimmy Carter was running for recreational purpose, which started with Arthur Lydiard, a coach from New Zealand, became popular in the U.S.A with the contribution of the former Oregon athletics coach Bill Bowerman. Ken Cooper's classic Aerobics and the 1972 Olympic marathon success of Frank Shorter and other runners such as Bill Rodgers and Jeff Galloway are credited with accelerating the development and spread of recreational running (Lathan, 2023). Today, running has become an extremely popular activity primarily performed due to its health benefits by recreational participants worldwide. Running can prevent or even cure chronic and non-communicable diseases, protect cardiovascular health and reduce the risk of death (Lavie et al., 2015; Lee et al., 2014). It also protects mental health and reduce the mental stress, especially in runners who participate regularly in community-based running (Grunseit et al., 2018; Qurik et al., 2021). The public perception of running as a health-promoting activity and its recognition as the most visible leisure activity since the 1970s has ensured that distance runners are now recognized as an important leisure interest group in society (Shipway et al., 2013). There has been a social transformation due to the development in the industry and technology, such that people have sufficient leisure and an increased awareness of participation in recreational physical activities (Wang, 2018; Zhang, 2012; Zou et al., 2019). In recent years, the number of endurance runners increased 2.5 times compared to 2016, while more and more amateur athletes started to run ultramarathons instead of short distances like 5K or half marathons (Yang et al., 2022). City marathons and multi-day international running events allow participants to escape from daily responsibilities and fatigue, share a pleasant and relaxing environment and the gives the opportunity to make new friends and network joining the event within a group (Goodsell et al., 2013; Xu et al., 2017). Thus, it is not surprising that the popularity of organizations such as 5 kilometers, half mara-thons, marathons and ultramarathons has increased all over the world in recent years (Deutsche

Ultramarathon Vereinigung, 2018; Mueller, 2019; Scheer, 2019). An ultramarathon (UM) is defined as any running race that exceeds the standard marathon distance (26.2 miles; 42 km) (Hofman, 2010) and pushes the physiological limits of runners depending on its extreme conditions such as the terrain (e.g. sand, mountainous), technical aspects (e.g. navigation), format (e.g. set time or set distance) and environmental conditions (e.g. altitude, extreme heat or cold) (Hofman, 2010; Hofman et al., 2010; Hofman and Krishman, 2014). Several studies were focused on the trends in participation and performance (da Fonseca-Engelhardt et al., 2013; Knechtle et al., 2012) as well as differences in performance between genders (in half marathon, marathon and UM) in adults and also among children (Eichenberger et al., 2012; Knechtle and Nikolaidis, 2018; Nikolaidis et al., 2021; Scheer et al., 2020). Sociodemographic characteristics (Hoffman and Fogard, 2012), general health status (Hoffman and Krishnan, 2014), psychological factors (Roebuck, 2018), and exercise behaviors (Hoffman and Krishnan, 2013) of UM runners have been studied widely, but these studies generally tend to focus more on differences in performance parameters and finish rates in ultrarunning (Knoth et al., 2012). Thanks to many scientists in this field, there is growing literature to understand the motivational factors for UM running based on age (León-Guereño et al., 2021; Scheer, 2019), gender, sportive background (Hoffman and Krouse, 2018), while a recent study examined the diversity of motivational factors for UM running based on the reversal theory suggesting that UM running necessitate a diverse and dynamic meta-motivational orientation that needs to be further investigated (Watkins, 2022).

Exploring the motivations behind UM running can provide insights into how people cope with challenges and derive satisfaction from their participation. Understanding these reasons is crucial for enhancing performance and fostering continued engagement in distance running. Considering the recent increase in participation of UM running, this study will provide valuable insights into athletes' psychology by examining the motivations that compel individuals to engage in physically and psychologically challenging activities. Therefore, the aim of this study was to determine the motivational factors for participating and/or train for an UM run for recreational purposes.

Materials and Methods

Model of The Research

Quantitative research model was used in this cross-sectional research. In this context, the study was carried out in a descriptive survey model. This model comprises of the researches, carried out in large groups, to receive opinions & observe attitudes of the individuals in such group concerning a fact or an event, as well as describing these facts and events (Karakaya, 2012).

Population and Sample / Study Group

Convenience sampling method was used in the research, as one of the purposive sampling methods. When calculating the sample size, GPower 3.1 (Germany) program was used. As a result of the power analysis (1-β=.80, α=.05 and d=.30), it was understood that the minimum sample size to participate in the research should be 90 recreational runners. The sample of this study consisted of 98 healthy and normotensive recreational amateur runners participating in the Salomon Cappadocia Ultra Trail run, which was held in 2023 through the hills and valleys of the unique Cappadocia region in Turkey. The distance of the race, in which a total of 190 runners participated and 126 finished, is 119,8 km with an altitude change of 3730+ m and participants must complete the route consisting of 10 checkpoints in less than 24 hours (Figure 1).
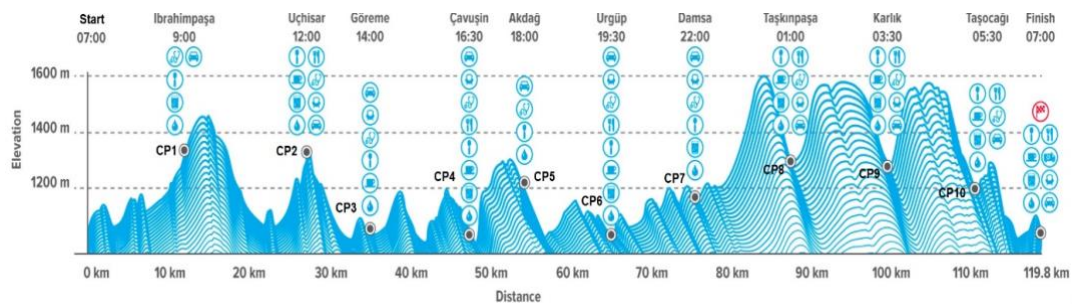

Figure 1. Schematic representation of 119,8-km ultra-trail run with detailed distance, altimetry, time zone, and check points (CP) (https://cappadociaultratrail.com).

Descriptive characteristics, training frequency and running distance of the participants are given in Table 1.

Table 1

Descriptive Characteristics of The Participants

		Female		Male		Total	
		n	**%**	**n**	**%**	**n**	**%**
		23	23,5	75	76,5	98	100
Age	<35	2	8,7	8	10,7	10	18,4
	35-40	7	30,4	19	25,3	26	18,4
	41-45	6	26,1	18	24	24	24,5
	46-50	3	13,1	15	20	18	18,4
	>51	5	21,7	15	20	20	20,4
	Total	23	100	75	100	98	100
	x̄ ±sd	43,87±7,89		43,59±8,30		43,65+8,16	
Marital status	Married	60	80	18	78,3	63	64,2
	Single	15	20	5	21,7	35	35,8
	Total	75	100	23	100	98	100
Education	High school	19	25,3	4	17,4	23	23,5
	Bachelor	47	62,7	7	30,4	54	55,1
	Graduate	9	12	12	52,2	21	21,4
	Total	75	100	23	100	98	100
	3 days	1	4,3	14	18,7	15	15,3

Training frequency/week	4 days	3	13,0	15	20,0	18	18,4
	5 days	6	26,1	30	40,0	36	36,7
	6 days	9	39,1	11	14,7	20	20,4
	7 days	4	17,4	5	6,7	9	9,2
	Total	23	100	75	100	98	100
	x̄ ±sd	5,52±1,08		4,71±1,14		5,05±,96	
Training distance/week	0-30 km	11	14,6	2	8,7	13	13,3
	31-60 km	21	28,0	7	30,4	29	29,6
	61-90 km	26	34,7	14	60,9	39	39,8
	>91 km	17	22,7	-	-	17	17,3
	Total	75	100	23	100	98	100

According to Table 1, 23.5% of the participants are female, 64.2% are married and only 25.3% are graduate from high school, 36.7% of the participants trained 5 days a week, and 39.8% of them ran between 61-90 km weekly.

Data Collection Tools

Ultra Marathon Motivation Scale (UMMS) developed by Masters et al. (1993) and adapted to Turkish by Çalışkan and Ardahan (2022) was used as the data collection tool in the study. The scale consists of 46 items and 10 subscales such as self-esteem, recognition/approval, psychological coping, affiliation, personal goal achievement, health orientation, competition, weight concern, life meaning and competition with oneself. UMMS is a seven-point Likert type and is scored between 1 (not a reason) and 7 (the most important reason).

Analysis of Data

Statistical analyzes of the data were evaluated using the IBM Statistics (SPSS, version 25.0, Armonk, NY, USA) package program. Since it was understood that the data analyzed with the Kolmogorov-Smirnov test showed normal distribution, independent samples t-test was used for pairwise comparisons and one-way ANOVA test was used for comparisons of more than two variables. For more than two variables, the Bonferroni test was used as a post-hoc test to determine which variables had the difference. Data are expressed as frequency, percentage and mean±standard deviation (x̄±sd). The significance level was accepted as $p<.05$.

Ethics of Research

All participants signed an informed consent form before participation. The study adhered to the Helsinki Declaration, and Clinical Research Ethics Committee approval was obtained from the local university to eliminate ethical concerns (Approval no:2022.26.04/96). During the current research, we acted within the framework of the "Higher Education Institutions Scientific Research and Publication Ethics Directive".

Results

Table 2

Kruskal-Wallis H Test Results Between Participants' Age and UMMS Sub-Dimensions

UMMS sub-dimensions	Age	n	Mean Rank	x^2	p	Post-hoc
Self-esteem	1) <35	18	60,64	11,708	,020*	4>1,3
	2) 35-40	18	52,47			5>1
	3) 41-45	24	57,33			
	4) 46-50	18	34,58			
	5) >51	20	40,83			
	Total	98				
Recognition/Approval	1) <35	18	46,00	4,743	,315	
	2) 35-40	18	60,11			
	3) 41-45	24	53,04			
	4) 46-50	18	42,56			
	5) >51	20	45,10			
	Total	98				
Psychological Coping	1) <35	18	55,75	9,390	,052	
	2) 35-40	18	54,97			
	3) 41-45	24	56,31			
	4) 46-50	18	32,97			
	5) >51	20	45,65			
	Total	98				
Affiliation	1) <35	18	50,17	10,696	,030*	4>3
	2) 35-40	18	53,97			
	3) 41-45	24	60,50			
	4) 46-50	18	32,56			
	5) >51	20	46,93			
	Total	98				
Personal Goal Achievement	1) <35	18	57,61	9,768	,045*	4>1,2,3
	2) 35-40	18	54,97			
	3) 41-45	24	55,77			
	4) 46-50	18	33,67			
	5) >51	20	44,00			
	Total	98				
Health Orientation	1) <35	18	58,03	13,029	,011*	4>1,3
	2) 35-40	18	57,89			5>1
	3) 41-45	24	56,88			
	4) 46-50	18	33,50			
	5) >51	20	39,83			
	Total	98				
Competition	1) <35	18	53,89	5,228	,265	
	2) 35-40	18	58,89			
	3) 41-45	24	50,60			
	4) 46-50	18	44,50			
	5) >51	20	40,28			
	Total	98				
Weight Concern	1) <35	18	56,81	6,910	,141	
	2) 35-40	18	53,44			
	3) 41-45	24	55,88			
	4) 46-50	18	40,00			
	5) >51	20	40,28			
	Total	98				
Life Meaning	1) <35	18	57,75	13,748	,008*	4>1,3
	2) 35-40	18	55,22			
	3) 41-45	24	58,08			
	4) 46-50	18	30,69			

	5) >51	20	43,55			
	Total	98				
	1) <35	18	57,44			
	2) 35-40	18	57,36			
Competition with oneself	3) 41-45	24	58,79	14,952	,005*	4>3
	4) 46-50	18	32,67			
	5) >51	20	39,28			
	Total	98				

*p<.05

It was seen that there was a significant difference between age of the participants and sub-dimensions of self-esteem, affiliation, personal goal achievement, health orientation, life meaning and competition with oneself. When the Table 2 is examined, it is understood that the factors that motivate recreational running individuals, especially those over the age of 45, to run UMs are increasing.

Table 3

Mann-Whitney U Test Results Between Participants' Gender and UMMS Sub-Dimensions

UMMS Sub-dimensions	Gender	n	Mean Rank	Sum of Ranks	U	p
Self-esteem	Female	23	52,96	1218,00	783,000	,503
	Male	75	48,44	3633,00		
Recognition/Approval	Female	23	43,02	989,50	713,500	,210
	Male	75	51,49	3861,50		
Psychological Coping	Female	23	51,85	1192,50	808,500	,650
	Male	75	48,78	3658,50		
Affiliation	Female	23	40,04	921,00	645,000	,067
	Male	75	52,40	3930,00		
Personal Goal Achievement	Female	23	48,46	1114,50	838,500	,839
	Male	75	49,82	3736,50		
Health Orientation	Female	23	51,30	1180,00	821,000	,726
	Male	75	48,95	3671,00		
Competition	Female	23	36,76	845,50	569,500	,013*
	Male	75	53,41	4005,50		
Weight Concern	Female	23	42,15	969,50	693,500	,155
	Male	75	51,75	3881,50		
Life Meaning	Female	23	52,54	1208,50	792,500	,549
	Male	75	48,57	3642,50		
Competition with oneself	Female	23	51,63	1187,50	813,500	,674
	Male	75	48,85	3663,50		

*p<.05

When Table 3 was examined, it was determined that there was a statistically significant difference between the gender of the participants and only the competition sub-dimension (p<.05) and that the average score of male participants in competition sub-dimension was higher than that of female participants.

Table 4

One-Way ANOVA Results Between Participants' Education and UMMS Sub-Dimensions

UMMS Sub-dimensions	Education	n	$\bar{X}$	Sd	F	p	Post-hoc
Self-esteem	1) High school	23	39,95	20,95	,932	,397	

UMMS Sub-dimensions		n	$\bar{X}$	Sd	F	p	
	2) Bachelor	54	42,92	19,37			
	3) Graduate	21	36,00	20,45			
	Total	98	40,74	19,96			
Recognition/Approval	1) High school	23	17,34	9,66			
	2) Bachelor	54	17,85	9,89	,039	,962	
	3) Graduate	21	17,19	12,09			
	Total	98	17,59	10,24			
Psychological Coping	1) High school	23	32,52	17,03			
	2) Bachelor	54	36,24	16,62	,545	,582	
	3) Graduate	21	32,76	17,98			
	Total	98	34,62	16,93			
Affiliation	1) High school	23	15,78	9,11			
	2) Bachelor	54	16,92	8,17	2,782	,067	
	3) Graduate	21	11,95	7,21			
	Total	98	15,59	8,36			
Personal Goal Achievement	1) High school	23	17,30	9,24			
	2) Bachelor	54	18,25	8,47	1,991	,142	
	3) Graduate	21	13,80	8,63			
	Total	98	17,08	8,78			
Health Orientation	1) High school	23	22,00	11,87			
	2) Bachelor	54	23,53	10,23	2,069	,132	
	3) Graduate	21	17,80	11,69			
	Total	98	21,94	11,06			
Competition	1) High school	23	8,08	4,76			
	2) Bachelor	54	9,27	5,26	1,759	,178	
	3) Graduate	21	6,90	4,81			
	Total	98	8,48	5,09			
Weight Concern	1) High school	23	10,73	6,66			
	2) Bachelor	54	12,29	5,49	4,273	,017*	3>2
	3) Graduate	21	8,04	4,91			
	Total	98	11,02	5,86			
Life Meaning	1) High school	23	8,95	4,82			
	2) Bachelor	54	9,64	4,30	,455	,636	
	3) Graduate	21	8,61	4,86			
	Total	98	9,26	4,52			
Competition with oneself	1) High school	23	8,91	4,86			
	2) Bachelor	54	10,01	4,20	,823	,442	
	3) Graduate	21	8,76	4,97			
	Total	98	9,48	4,52			

*p<.05

When Table 4 was examined, it was determined that there was a statistically significant difference between the education levels of participants and the weight control sub-dimension (p<.05), and that weight control was a dominant source of motivation in graduate participants.

Table 5

One-Way ANOVA Results Between Training Frequency and UMMS Sub-Dimensions

UMMS Sub-dimensions	Training frequency /week	n	$\bar{X}$	Sd	F	p
Self-esteem	4 days	33	34,61	21,75		
	5 days	36	45,44	18,77		
	6 days	20	40,80	17,17	1,78	,156
	7 days	9	42,89	20,79		
	Total	98	40,61	19,95		
Recognition/Approval	4 days	33	17,48	10,80		
	5 days	36	18,11	11,03	,037	,990
	6 days	20	17,30	8,94		

UMMS Sub-dimensions		n	$\bar{X}$	Sd	F	p
	7 days	9	17,33	8,23		
	Total	98	17,66	10,19		
Psychological Coping	4 days	33	30,82	17,79	,970	,410
	5 days	36	37,44	16,48		
	6 days	20	36,20	16,44		
	7 days	9	33,44	15,50		
	Total	98	34,59	16,84		
Affiliation	4 days	33	13,61	8,06	1,886	,137
	5 days	36	18,00	8,36		
	6 days	20	14,65	7,94		
	7 days	9	14,11	7,96		
	Total	98	15,48	8,25		
Personal Goal Achievement	4 days	33	15,97	9,00	,649	,585
	5 days	36	18,64	8,69		
	6 days	20	16,20	8,56		
	7 days	9	16,22	8,69		
	Total	98	17,02	8,72		
Health Orientation	4 days	33	20,18	12,00	,736	,533
	5 days	36	24,18	12,00		
	6 days	20	21,65	10,67		
	7 days	9	20,78	10,16		
	Total	98	21,95	11,07		
Competition	4 days	33	7,76	4,71	2,012	,118
	5 days	36	9,83	5,41		
	6 days	20	6,75	4,36		
	7 days	9	9,33	5,39		
	Total	98	8,46	5,05		
Weight Concern	4 days	33	10,42	6,29	,842	,474
	5 days	36	12,31	6,20		
	6 days	20	10,10	5,32		
	7 days	9	10,89	3,86		
	Total	98	11,09	5,88		
Life Meaning	4 days	33	8,55	5,04	,649	,586
	5 days	36	10,06	4,41		
	6 days	20	9,10	4,23		
	7 days	9	9,11	3,79		
	Total	98	9,27	4,53		
Competition with oneself	4 days	33	8,97	4,95	,771	,513
	5 days	36	10,33	4,22		
	6 days	20	9,10	4,32		
	7 days	9	8,44	4,48		
	Total	98	9,45	4,50		

p<.05

There was no statistically significant difference between training frequency and UMMS sub-dimensions (Table 5).

Tablo 6

One-Way ANOVA Test Results Between Training Distance and UMMS Sub-Dimensions

UMMS Sub-dimensions	Training distance/week	n	$\bar{X}$	Sd	F	p
Self-esteem	0-30 km	13	29,77	19,47	1,780	,156
	31-60 km	29	46,69	16,41		
	61-90 km	39	38,79	21,35		
	>91 km	17	42,71	19,98		
	Total	98	40,61	19,95		
Recognition/Approval	0-30 km	13	16,62	9,45	,037	,990
	31-60 km	29	16,97	11,07		

	61-90 km	39	17,28	9,31	
	>91 km	17	20,53	11,43	
	Total	98	17,66	10,19	
Psychological Coping	0-30 km	13	30,46	17,76	
	31-60 km	29	39,69	14,63	
	61-90 km	39	32,95	17,63	,970
	>91 km	17	32,82	17,31	,410
	Total	98	34,59	16,84	
Affiliation	0-30 km	13	12,38	7,47	
	31-60 km	29	15,69	8,46	
	61-90 km	39	15,33	8,26	1,886
	>91 km	17	17,82	8,36	,137
	Total	98	15,48	8,25	
Personal Goal Achievement	0-30 km	13	14,77	9,31	
	31-60 km	29	18,72	8,43	
	61-90 km	39	16,31	8,84	,649
	>91 km	17	17,47	8,71	,585
	Total	98	17,02	8,72	
Health Orientation	0-30 km	13	18,62	11,51	
	31-60 km	29	24,76	11,15	
	61-90 km	39	21,00	10,89	,736
	>91 km	17	21,88	10,87	,533
	Total	98	21,95	11,07	
Competition	0-30 km	13	6,69	4,21	
	31-60 km	29	8,79	5,66	
	61-90 km	39	7,69	4,77	2,012
	>91 km	17	11,00	4,51	,118
	Total	98	8,46	5,05	
Weight Concern	0-30 km	13	9,85	5,99	
	31-60 km	29	11,17	6,36	
	61-90 km	39	11,08	5,86	,842
	>91 km	17	11,94	5,33	,474
	Total	98	11,09	5,88	
Life Meaning	0-30 km	13	8,23	5,26	
	31-60 km	29	10,31	4,23	
	61-90 km	39	9,03	4,61	,649
	>91 km	17	8,82	4,30	,586
	Total	98	9,27	4,52	
Competition with oneself	0-30 km	13	8,08	5,20	
	31-60 km	29	10,89	3,81	
	61-90 km	39	9,00	4,73	,771
	>91 km	17	9,06	4,26	,513
	Total	98	9,45	4,50	

p<.05

In Table 6, it was seen that there was no significant difference between weekly training distance and UMMS sub-dimensions. Also show that weekly training distance had no effect on the motivation of UM running.

Discussion and Conclusion, Suggestions

Recently, the change in people's perceptions of a healthy lifestyle has caused a significant increase in their interest and participation in running activities. This increasing interest in participation in UM runs has led researchers to investigate what are the reasons that motivate recreational runners to participate in these runs, which require challenging conditions and exhausting

efforts. However, there are limited studies on the reasons that motivate people to run UM recreationally. Therefore, the purpose of this study was to determine the factors that motivate Turkish individuals who participate in ultramarathon runs for recreational purposes. Mean age of the participants of this study was 43.86 and 43.58 years for female male runners, respectively. Similarly, in studies conducted on ultrarunners, the average age was over 35 (Hoffman, 2020; Hoffman and Fogard, 2012; Hoffman and Krishnan, 2013; Hoffman and Wegelin, 2009; Knechtle, 2012; Knechtle et al., 2012; Nikolaidis and Knechtle, 2018). It was also understood that the female runners were older than the male runners in all age categories at the end of study. However, other studies have also found that male were older than female in the UM race, contrary to the findings of the study (Hoffman and Wegelin, 2009; Valentin et al., 2022). The most important finding of this study is that factors that motivate recreational runners, especially those over the age of 45 who are more likely to run UM, appear to be self-esteem, affiliation, personal goal attainment, health orientation, life meaning and competition with oneself. This finding, in line with the other studies, suggests that age influences many factors that motivate UM runners to participate in these activities (Hoffman and Krouse, 2018; Hoffman and Krishnan, 2014; Hoffman and Krishnan, 2013, Hoffman and Fogard, 2012; Hoffman and Wegelin, 2009). Ogles and Masters (2000) reported that while general health orientation is an important source of motivation in older runners, personal goal achievement is more important in younger runners. However, (Nikolaidis et al., 2019) stated that competition is more important in young male runners. Another study found that the most important factor motivating all runners to participate in UM races is maintaining physical condition and health, but young runners focus more on recognition, while older runners focus more on social aspects and contact with other runners (Poczta, 2018). They also reported that although affiliation is not a dominant motivational factor for older runners, it tends to increase as the difficulty of running increases. This is consistent with the findings of (Kazimierczak et al., 2020). They highlighted the importance of affiliation and social identity for participating UM running and reported health orientation was especially important for older runners.

Ultrarunners also tend to be older than traditional distance runners. Because most runners do not directly participate in UM runs. Instead, they first train for half and full marathons, and then gradually transition to ultradistance running. For this reason, people over the middle age participate more in UM races. Waśkiewicz (Waśkiewicz et al., 2018) stated that young runners naturally seek more competitive races to test their abilities and limits, while older athletes try to develop their own plans and performance regardless of external conditions such as weight loss, winning awards or being popular. Moreover, in addition to studies reporting that the age of ultrarunners increases as distance increases (Eichenberger et al., 2012; Knechtle et al., 2010), there are also studies reporting that the age at which the athlete reaches peak performance does not increase as race duration increases

(Stempień, 2014; Subic, 2024). Therefore, different motivational factors between genders might also be a potential reason to explain the differences in the ages of UM runners.

Another important finding is that the factor that drives people to UM running as a recreational activity is competition with oneself in terms of gender. Despite emerging knowledge regarding the effects of gender on participation in UM events, the reasons for women's lower participation in ultrarunning are still largely unknown. In this study, the ratio of female at-tending UM was 23.5%. This finding was in line with the literature and world standards. Similarly, Stempien (2014) reported that the rate of female participating in UM races was approximately 10% between 2003 and 2013, and increased to 23% in 2014, while Subic (2024) in his study examining more than 2 million marathon results, reported that 35.97% of the participants were female. Although the participation rate of female in UM races has increased over the years, it has been stated that it is still lower than that of male (Rüst et al., 2014; Çetin and Özman, 2019).

When the findings of study were compared, it was seen that male runners received higher scores than female in the competition sub-dimension. Since male are more advantageous than female in terms of both their physical characteristics and endurance capacity, it was an expected result that they would be more competitive than female in competition dimension motivated to participate in UM races. Conflicting results were encountered regarding UM runners in the literature. It was determined that male runners participating in the UM showed significant differences in self-esteem, psychological coping and life meaning (Çetin and Özman, 2019). However, Ferrer (2015) found that there was no significant difference between the gender and motivation level of runners participating in UM. Similarly, in another study Ogles (1995) reported that female had higher scores than male in the sub-dimensions of weight control, belonging/socialization, self-esteem, psychological coping and life meaning, which are among the factors that motivate participation in UM. In the same study which is comparing performance and recreational athletes, it was determined that the motivations of male performance athletes were more based on recognition, competition and personal goal achievement, while the motivation of recreational male runners was general health orientation and weight control. Krouse (2011) found that the highest motivational source for female UM runners was personal goal achievement and health orientation, followed by self-confidence. In another study, it was reported that the most important source of motivation for both male and female UM runners was to push their limits rather than the desire to win. In terms of gender, it was stated that maintaining physical condition and health is an important source of motivation for male, while establishing social relationships is an important source of motivation for female. These results were similar to findings of Hautbois et al. (2020) and Knoth et al. (2012). Knoth et al. (2012) reported that UM running contributes to male's physical capacity or strength, and Hautbois et al. (2020) claimed that UM

running benefits female more than male in that it gives them the opportunity to meet more people, saves them from depression, and makes them feel less shy. All participants reported participating in UM runs for excitement, pleasure, relaxation, and escape from the tasks and challenges of daily life. It has been understood that participating in UM races is a very important source of motivation for females, especially in terms of escaping from the duties and difficulties of daily life. The results show that people participate in running not only for physical activity but also for mental health. This may be the reason for the recent increase in the number of females participating in UM runs. Working females and housewives generally have different lifestyles, and their daily lives are often monotonous due to the responsibilities of home, family and business life. Therefore, participating in UM races becomes more important for them. Similarly, studies have generally found that weight concern, affiliation, self-esteem, psychological coping, and life meaning were more important motivators for females than males to participate in UM runs (Krouse et al., 2011; Malchrowicz-Mośko and Waśkiewicz, 2020; Thuany et al., 2021).

Despite emerging knowledge regarding the effects of gender on participation in UM events, factors that motivate people to run an UM are still not fully understood. It is thought that the different findings in the literature are due to the samples being from different cultures. Because the value judgments of every society are different and a socio-cultural characteristic that is more dominant in one society may not be dominant in another society. Therefore, the necessity for male to be more dominant than female in all areas of life in Turkish culture may have caused this result. Moreover, the fact that male is more advantageous than female in terms of both physical characteristics and endurance capacity may have caused them to be more competitive than female in terms of their motivation to participate in UM runs.

It was found that the UM runners who participated in the study were well-educated middle-aged men (30.4%) and women (62.7%), with the majority being highly educated with 52.2% and 12%, respectively. Similarly, Hoffman and Fogard (2012) reported that 43.6% of 161 km UM runners had a bachelor degree and 37.2% and graduate degree. Moreover, they reported that the factor that motivated well-educated runners to run UM was weight concerns. Similarly, Çalışkan and Ardahan (2022) was found that runners with bachelor or graduate degree had lower scores than runners with high school degrees in self-esteem, psychological coping, weight concerns and life meaning sub-dimensions. It is understood that the education level of the participants causes different motivation to participate in UM races. Since there are limited studies on the effect of the education level of individuals participating in UM races on their motivation to participate in these races, more studies are needed to comment on what effect education has.

Research findings revealed that neither weekly training frequency nor training distance was a motivator for participation in UM running. However, Waśkiewicz (2018) reported that, contrary to the study findings, training experience was negatively correlated to level of motivation in ultradistance runners. In other words, as the weekly running distance increases, the motivation to participate in UM runs decreases. But, most of the studies in the literature have examined the relationship between weekly training distance and race duration or competitive performance rather than factors that motivate runners to participate in a UM race (Billat et al., 2001; Gerasimuk et al., 2021; Knechtle et al., 2010; Rozmiarek et al., 2021). Therefore, it is difficult to make a judgment as there is limited studies examining the factors that motivate male and female to spend their free time doing long and strenuous training to participate in UM running (Frick, 2011; Krouse et al., 2011). Because preparing for ultra-endurance running requires recreational runners to sacrifice most of their free time for training rather than social relationships such as family, friends, and work (Mueller et al., 2019). Ultrarunning is a special way of life and competition and if you want to perform well in these events, you must commit to a certain lifestyle and maintain it for many years. After all, participating in an UM is a test of a runner's own mental and physical endurance, as well as their strength to overcome obstacles that would be impossible to overcome individually. Thus, it is reasonable to assume that motivation might vary among UM runners of different distances.

As a conclusion of this research, the factors that motivate runners who participate in UM runs recreationally differ according to age, gender and education level. It has been determined that as runners get older, factors such as self-esteem, affiliation, personal goal achievement, health orientation, life meaning and competition with others motivate them to participate in UM runs. Moreover, it has been understood that the reason that motivates male runners to participate in UM runs more than female runners is the feeling of competition with other runners, and as the education level of runners increases, weight concern is the most effective factor in motivating them. However, it was determined that the runners' marital status, weekly training frequency and running distance did not have any effect on their motivation to participate in UM runs. Reading these motivating variables may create more efficient training programs for improving athletes' performances and mental fortitude. These programs are essential for preventing injuries and ensuring sustained engagement over time. Moreover, this study significantly contributes to the broader domain of sports science by offering valuable insights into sports' mental health advantages and community development aspects.

The most important limitation of this study is that the participants were only runners who participated in 119K UM competition. UM running is not considered a single sporting event, but has various forms that vary depending on distance or time. Therefore, it is important for future studies to examine separately the factors that motivate recreational runners participating in different UM events

and to examine their specific training, physiology and anthropometric characteristics for a better understanding of the issue. Consequently, our findings should be interpreted taking into account the distance or time of UM races.

Ethics Committee Permission Information

Ethics review board: Inonu University Scientific Research and Publication Ethics Committee

Date of ethical approval document: 26.04.2022

Issue number of the ethical approval document: 96

Authors' contributions

Design of the study 1,2,3,4; collection of data, 1,2; statistical analysis, 1,3.; interpretation of data, 1,2,3,4; preparation of manuscript, 1,2,3,4; literature review, 1,2,4.

Conflicts of interest

The authors declare no conflicts of interest. All authors have read and agreed to the published version of the manuscript.

Statement of Support and Acknowledgment

The authors would like to thank all participants for their voluntary participation. All authors contributed equally to the writing of this article.

References

Anderson, J. K. (1985). *Hunting in the ancient world*. University of California Press.

Bale, J. (2004). *Running cultures: Racing in time and space*. Frank Cass.

Billat, V. L., Demarle, A., Slawinski, J., Paiva, M., & Koralsztein, J. P. (2001). Physical and training characteristics of top-class marathon runners. *Med Sci Sports Exerc*, *33*(12), 2089-97. https://doi.org/10.1097/00005768-200112000-00018

Çalışkan, A., & Ardahan, F. (2022). Developing the motivational factor scale for participating in ultra marathon. *International Journal of Holistic Health, Sport and Recreation*, *1*(1), 1-16. https://doi.org/10.5281/zenodo.7489962

Çetin, A., & Özman, C. (2019). Runners' motivational dimensions for participation in the ultra-marathon events and the comparison of these factors with their life satisfaction and success perceptions. *Spormetre*, *17*(2), 177-187. https://doi.org/10.33689/spormetre.531348,

da Fonseca-Engelhardt, K., Knechtle, B., Rüst, C. A., Knechtle, P., Lepers, R., & Rosemann, T. (2013). Participation and performance trends in ultra-endurance running races under extreme conditions-'Spartathlon'versus 'Badwater'. *Extreme Physiology & Medicine*, *2*, 1-11. https://doi.org/10.1186/2046-7648-2-15

Deutsche Ultramarathon Vereinigung. (2024, 21 June). *Ultra marathon statistics*. Deutsche Ultramarathon Vereinigung. http://statistik.d-u-v.org/index,php

Eichenberger, E., Knechtle, B., Rüst, C. A., Rosemann, T., & Lepers, R. (2012). Age and gender interactions in mountain ultra-marathon running-the 'Swiss Alpine Marathon'. *Open Access J Sports Med.*, *3*, 73-80. https://doi.org/10.2147%2FOAJSM.S33836

Ferrer, D. A., Baumann, C. W., Brandenberger, K. J., Ellis, R., & Otis, J. S. (2015). Physical motivation influences race performance over a 24-hour ultra-marathon. *International Journal of Sport Studies*, *5*(10), 1162-1169.

Frick, M. (2011). Gender differences in competitive orientations: empirical evidence from ultramarathon running. *Journal of Sports Economics*, *12*(3), 317-340. https://doi.org/10.1177/152700251140478

Gerasimuk, D., Malchrowicz-Mośko, E., Stanula, A., Bezuglov, E., Achkasov, E., Swinarew, A., & Waśkiewicz, Z. (2021). Age-Related Differences in Motivation of Recreational Runners, Marathoners, and Ultra-Marathoners. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.738807

Goffman, E. (1971). *Relations in public: Microstudies of the public order*. Harper & Row.

Goodsell, T. L., Harris, B. D., & Bailey, B. W. (2013). Family status and motivations to run: a qualitative study of marathon runners. *Leisure Science*, *35*, 337-352. https://doi.org/10.1080/01490400.2013.797326

Grunseit, A., Richards, J., & Merom, D. (2018). Running on a high: Parkrun and personal well-being. *BMC Public Health*, *18*, 59. https://doi.org/10.1186/s12889-017-4620-1

Hautbois, C., Djaballah, M., & Desbordes, M. (2020). The social impact of participative sporting events: a cluster analysis of marathon participants based on perceived benefits. *Sport Soc.*, *23*, 335–353. https://doi.org/10.1080/17430437.2019.1673371

Hoffman, M. D. (2010). Performance trends in 161-km ultramarathons. *Int J Sports Med.*, *31*, 31-37. https://doi.org/10.1055/s-0029-1239561

Hoffman, M. D. & Wegelin, J. A. (2009). The western states 100-mile endurance run: participation and performance trends. *Medicine & Science in Sports & Exercise*, *41*(12), 2191-2198. https://doi.org/10.1249/MSS.0b013e3181a8d553

Hoffman, M. D., & Fogard, K. (2012). Demographic characteristics of 161-km ultramarathon runners. *Research in Sports Medicine*, *20*(1), 59-69. https://doi.org/10.1080/15438627.2012.634707

Hoffman, M. D., & Krishnan, E. (2013). Exercise behavior of ultramarathon runners: baseline findings from the ULTRA study. *The Journal of Strength & Conditioning Research*, *27*(11), 2939-2945. https://doi.org/10.1519/jsc.0b013e3182a1f261

Hoffman, M. D., & Krishnan, E. (2014). Health and exercise-related medical issues among 1,212 ultramarathon runners: baseline findings from the Ultrarunners Longitudinal TRAcking (ULTRA) Study. *PloS one, 9*(1), e83867. https://doi.org/10.1371/journal.pone.0083867

Hoffman, M. D., & Krouse, R. (2018). Ultra-obligatory running among ultramarathon runners. *Research in Sports Medicine*, *26*(2), 211-221. https://doi.org/10.1080/15438627.2018.1431533

Hoffman, M. D., Ong, J. C., & Wang, G. (2010). Historical analysis of participation in 161 km ultramarathons in north America. *The International Journal of the History of Sport*, *27*(11), 1877-1891. https://doi.org/10.1080/09523367.2010.494385

Karakaya, İ. (2012). *Bilimsel araştırma yöntemleri*. A. Tanrıöğen (Edt.) Bilimsel araştırma yöntemleri. Anı Yayıncılık.

Kazimierczak, M., Da browska, A., Adamczewska, K., & Malchrowicz-Mo´sko, E. (2020). The impact of modern ultramarathons on shaping the social identity of runners, The case study of karkonosze winter ultramarathon. *Int. J. Environ Res Public Health*, *17*, 116. https://doi.org/10.3390/ijerph17010116

Knechtle, B. (2012). Ultramarathon runners: nature or nurture? *Int J Sports Physiol Perform*, *7*, 310-312. https://doi.org/10.1123/ijspp.7.4.310

Knechtle, B., &Nikolaidis, P. T. (2018). Physiology and pathophysiology in ultra-marathon running. *Frontiers in Physiology*, *9*, 634. https://doi.org/10.3389/fphys.2018.00634

Knechtle, B., Knechtle, P., & Rosemann, T. (2010). Race performance in male mountain ultra-marathoners: anthropometry or training? *Percept Mot Skills*, *110*(3Pt1), 721-35. https://doi.org/10.2466/PMS.110.3.721-735

Knechtle, B., Rüst, C. A., Rosemann, T., & Lepers, R. (2012). Age-related changes in 100-km ultra-marathon running performance. *Age*, *34*(4), 1033-1045. https://doi.org/10.1007/s11357-011-9290-9

Knoth C., Knechtle, B., Rüst, C. A., Rosemann, T., & Lepers, R. (2012). Participation and performance trends in multistage ultramarathons-the 'Marathon Des Sables' 2003–2012. *Extreme Physiology & Medicine*, *1*(1), 13. https://doi.org/10.1186/2046-7648-1-13

Krouse, R. Z., Ransdell, L. B., Lucas, S. M., & Pritchard, M. E. (2011). Motivation, goal orientation, coaching, and training habits of women ultrarunners. *J Strength Cond Res*, *25*, 2835-2842. https://doi.org/10.1519/jsc.0b013e318204caa0

Lathan, S. R. (2023). A history of jogging and running-the boom of the 1970s. *In Baylor University Medical Center Proceedings, USA*, *36*(6), 775-777.

Lavie, C. J., Lee, D. C., Sui, X., Arena, R., O'Keefe, J. H., Church, T. S., Milani, R. V., & Blair, S. N. (2015). Effects of running on chronic diseases and cardiovascular and all-cause mortality. *Mayo Clin. Proc*, *90*, 1541–1552. https://doi.org/10.1016/j.mayocp.2015.08.001

Lee, D. C., Pate, R. R., Lavie, C. J., Sui, X., Church, T. S., & Blair, S. N. (2014). Leisure-time running reduces all-cause and cardiovascular mortality risk. *J Am Coll Cardiol*, *64*, 472-481. https://doi.org/10.1016%2Fj.jacc.2014.04.058

León-Guereño, P., Galindo-Domínguez, H., Balerdi-Eizmendi, E., Rozmiarek, M., & Malchrowicz-Mośko, E. (2021). Motivation behind running among older adult runners. *BMC Sports Science Medicine and Rehabilitation*, *13*, 1-10. https://doi.org/10.1186/s13102-021-00366-1

Malchrowicz, J., Malchrowicz-Mośko, E., & Fadigas, A. (2018). Age-related motives in mass running events participation. *Olimp J Olympic Stud, 2*, 257–273. https://doi.org/10.30937/2526-6314.v2n1.id42

Masters, K. S., Ogles, B. M., & Jolton, J. A. (1993). The development of an instrument to measure motivation for marathon running: *The Motivations of Marathoners Scales (MOMS). Research quarterly for exercise and sport*, *64*(2), 134-143. https://doi.org/10.1080/02701367.1993.10608790

Mueller, J. T., Landon, A. C., & Graefe, A. R. (2019). Modeling the role of social identity in constraint negotiation for ultra-endurance gravel cycling. *Journal of Leisure Research*, *50*(2), 81-106. https://doi.org/10.1080/00222216.2018.1561167

Nikolaidis, P. T., & Knechtle, B. (2018). Age of peak performance in 50-km ultramarathoners–is it older than in marathoners?. *Open Access Journal of Sports Medicine*, *9*, 37-45. https://doi.org/10.2147%2FOAJSM.S154816

Nikolaidis, P. T., Cuk, I., Clemente-Suárez, V. J., Villiger, E., & Knechtle, B. (2021). Number of finishers and performance of age group women and men in long-distance running: Comparison among 10km half-marathon and marathon races in Oslo, *Research in Sports Medicine*, *11*, 1-11. https://doi.org/10.1080/15438627.2020.1726745

Nikolaidis, P. T., Del Coso, J., Rosemann, T., & Knechtle, B. (2019). Muscle strength and flexibility in male marathon runners: the role of age, running speed and anthropometry. *Frontiers in Physiology*, *10*. https://doi.org/10.3389/fphys.2019.01301

Ogles, B, M., & Masters, K. S. (2000). Older vs. younger adult male marathon runners: Participative motives and training habits. *Journal of Sport Behavior*, *23*(2), 130-143.

Ogles, B. M., Masters, K. S., & Richardson, S. A. (1995). Obligatory running and gender: An analysis of participative motives and training habits. *Int. J. Sport Psychol*, *26*, 233-248.

Paunonen, A. (2004). Running speaks to more and more people. *Motion*, *1*, 36-37.

Poczta, J., Malchrowicz-Mośko, E., & Fadigas, A. B. M. (2018). Age-related motives in mass running events participation. *Olimpianos-Journal of Olympic Studies*, *2*(1), 257-273. https://doi.org/10.30937/2526-6314.v2n1.id42

Qurik, H., Bullas, A., Haake, S., Goyder, E., Graney, M., Wellington, C., & Stevinson, C. (2021). Exploring the benefits of participation in community-based running and walking events: a cross-sectional survey of parkrun participants. *BMC Public Health*, *21*, 1-15. https://doi.org/10.1186/s12889-021-11986-0

Roebuck, G. S., Fitzgerald, P. B., Urquhart, D. M., Ng, S. K., Cicuttini, F. M., & Fitzgibbon, B. M. (2018). The psychology of ultra-marathon runners: a systematic review. *Psychology of Sport and Exercise*, *37*, 43-58. https://doi.org/10.1016/j.psychsport.2018.04.004

Rozmiarek, M., Malchrowicz-Mośko, E., León-Guereño, P., Tapia-Serrano, M. Á., & Kwiatkowski, G. (2021). Motivational differences between 5k runners, marathoners and ultramarathoners in Poland. *Sustainability*, *13*(12), 6980. https://doi.org/10.3390/su13126980

Rüst, C. A., Knechtle, B., Knechtle, P., Rosemann, T., & Lepers, R. (2012). The age of peak performance in elite male and female Ironman triathletes competing in a qualifier for 'Ironman Hawaii'-'Ironman Switzerland' from 1995-2011. *Open Access J Sports Med*, *3*, 175-182. https://doi.org/10.2147/oajsm.s37115

Rüst, C. A., Zingg, M. A., & Rosemann, T., Knechtle, B. (2014). Will the age of peak ultra-marathon performance increase with increasing race duration? *BMC Sports Sci Med Rehabil*, *6*, 36. https://doi.org/10.1186/2052-1847-6-36

Salomon Cappadocia Ultra-trail (2024, 5 May). *Route of Salomon Cappadocia Ultra-Trail® CUT*. Salomon Cappadocia Ultra-trail. https://cappadociaultratrail.com

Scheer, V. (2019). Participation trends of ultra endurance events. *Sports Medicine and Arthroscopy Review*, *27*(1), 3-7. https://doi.org/10.1097/JSA.0000000000000198

Scheer, V., Di Gangi, S., Villiger, E., Nikolaidis, P. T., Rosemann, T., & Knechtle, B. (2020). Age-related participation and performance trends of children and adolescents in ultramarathon running. *Research in Sports Medicine*, *28*(4), 507-517. https://doi.org/10.1080/15438627.2020.1781124

Shipway, R., Holloway, I., & Jones, I. (2013). Organisations, practices, actors, and events: Exploring inside the distance running social world. *International Review for the Sociology of Sport*, *48*(3), 259-276. https://doi.org/10.1177/1012690212442135

Stempień, J. R. (2014). Płeć maratonu–sport czasu wolnego w doświadczeniach kobiet. *Kultura i Społeczeństwo*, *1*, 169-186. https://doi.org/10.2478/kultura-2014-0020

Stokvis, R. (2006). Hardlopende vrouwen in de openbare ruimte [Women running in public]. *Sociologie*, *2*(3), 249-264.

Subic, J. (2024, 20 June). *Women Are Better Runners than Men (2020 Analysis)*. Runrepeat, https://runrepeat.com/women-are-better-runners-than-men-2020

Thuany, M., Malchrowicz-Mośko, E., Waśkiewicz, Z., & Gomes, T. N. (2021). Individual and economic characteristics as determinants of Brazilian runners' motivation. *Sustainability, 13*, 10178. https://doi.org/10.3390/su131810178

Valentin, S., Pham, L. A., & Macrae, E. (2022). Enablers and barriers in ultrarunning: a comparison of male and female ultra-runners. *Sport in Society*, *25*(11), 2193-2212. https://doi.org/10.1080/17430437.2021.1898590

Van Bottenburg, M., Scheerder, J., & Hover, P. (2010). Don't miss the next boat, Europe's opportunities and challenges in the second wave of running. *New Studies in Athletics, 25*(34), 125-143.

Wang, H. (2018). Construction and analysis of a model of the relationship between social transformation and the benign promotion of sports values in China. *J Sport Cult*, *10*(7), 10-20.

Waśkiewicz, Z., Nikolaidis, P. T., Chalabaev, A., Rosemann, T., & Knechtle, B. (2018). Motivation in ultra-marathon runners. *Psychol Res Behav Manag*, *12*, 31-37. https://doi.org/10.2147/PRBM.S189061

Watkins, L., Wilson, M., & Buscombe, R. (2022). Examining the diversity of ultra-running motivations and experiences: A reversal theory perspective. *Psychology of Sport and Exercise*, *63*, 102271. https://doi.org/10.1016/j.psychsport.2022.102271

Xu G., Zhang, J., & Xu, J. (2017). A narrative of 100 marathon runners' experiences. *J Natl Taiwan Univ Sport Phys Educ*, *16*, 69-84.

Yang, J., Ju, F. Y., & Tian, Z. G. (2022). Sports and social interaction: Sports experiences and attitudes of the urban running community. *Int J Environ Res Public Health*, *19*(21), 14412. https://doi.org/10.3390%2Fijerph192114412

Zhang, Y. (2012). Social interaction in sport: A fundamental concept in the sociology of sport. *J Sport*, *19*, 7-12. https://doi.org/10.16237/j.cnki.cn44-1404/g8.2012.04.022

Zuo, Y., Zou, L., Zhang, M., Smith, L., Yang, L., Loprinzi, P. D., & Ren, Z. (2019). The temporal and spatial evolution of marathons in China from 2010 to 2018. *Int J Environ Res Public Health*, *16*, 5046. https://doi.org/10.3390%2Fijerph16245046