

Investigation of Primary Dysmenorrhea in Competitive Archers

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ABSTRACT

Purpose: The aim of this study is to investigate primary dysmenorrhea in competitive archer women.

Participants: The study included a total of 142 women participated in the 2019 archery archers competed in the Turkey championship. Participation was on a voluntary basis. The average age of the participants is 25.21 years.

Results: The archers stated that there was pain during the menstrual period with 66.2%, and this pain was moderate in 46.5%. According to the body mass index, pain during menstruation status and level of pain felt varies significantly ($p < 0.05$ and $p < 0.001$). All those with a body mass index of 25 kg / m² and above have constant or sometimes pain during the menstrual period. Again, the pain level of this group is in the medium and severe category. While 44.4% of archers' menstrual period has pain, weakness and nervousness, 16.9% of them lack coordination and loss of strength, 38.7% have all the symptoms. No statistically significant difference was found between the states of feeling yourself just before the menstrual period according to age categories ($p > 0.05$). A statistically significant difference was found between the state of feeling oneself during menstruation and 3 days after the onset of bleeding compared to the normal state ($p < 0.05$). There is no statistically significant difference in the use of pain relieving drugs during the menstrual period according to age category ($p > 0.05$). However, a statistically significant difference was found in the use of nutritional supplements during menstruation according to age category ($p < 0.05$). A significant correlation was found between body weight and pain and pain level in menstruation ($p < 0.01$). Likewise, a relationship was found between body mass index and pain and pain level during menstruation. ($p < 0.05$). According to the age of menarche, a meaningful relationship was determined regarding pain in the menstrual period ($p < 0.05$). As the age of menarche is delayed, the pain exposed decreases with age.

Conclusion: As a result, it was determined that the competitor archers who participated in our study suffered pain during the menstrual period and their pain levels were moderate. Patients with late menarche experience less pain than those with early menarche. However, it is thought that delaying the age of menarche with regular physical activity, which will be planned for at least 2 hours a day, will contribute positively to the height growth and will be less exposed to dysmenorrhea, which decreases as the age increases with late menarche.

Keywords: Menstruation, dysmenorrhea, archers

INTRODUCTION

Pre-menstrual syndrome is a disorder characterized by emotional, physical and behavioral symptoms that increase the severity of the menstrual cycle during the luteal phase in women of reproductive age and disappear spontaneously within a few days after the onset of menstruation¹. Primary dysmenorrhea is menstrual pain without pelvic pathology that occurs 1-2 years after menarche². The general prevalence of dysmenorrhea in girls during adolescence is between 60% and 90%, and it is known to decrease with age³. It is caused by increased or unbalanced endometrial prostanoid production during menstruation. Prostaglandins cause pain by increasing uterine tone and contractions. There are various medical and non-medical methods to alleviate or eliminate this problem². While dysmenorrhea is associate with a variety of physical symptoms, its symptoms typically occur a few hours before or after the onset of menstruation and lasts 24-48 hours. The pain is usually cramp-like and is most common in the form of lower abdominal pain and low back pain. Lower abdominal pain is often described as pain radiating to the lower back or legs. Dysmenorrhea may be accompanied by headache, nausea, constipation or diarrhea, frequent urination, vomiting, and emotional problems⁴. Physical activities of individuals may be restricted due to menstrual pain. At the same time, the general health perception of individuals with menstrual pain

is lower than that of normal individuals⁵. Menstrual problems are conditions that have significant effects on health and society, affect the vast majority of adolescent girls (approximately 75%) and require treatment. In addition, it has been stated that the most common menstrual problems are dysmenorrhea, amenorrhea, premenstrual syndrome and dysfunctional uterine bleeding⁶, of students in university education in Turkey is the most menstrual problems experienced by 89.5% rate of dysmenorrhea, menstrual irregularities by 31.2% and 5.3% are reported to be excessive bleeding⁷. These factors include low age, low body mass index, early menarche, smoking and alcohol use, perimenstrual somatic complaints, pelvic infections, and psychological disturbances⁸. Some studies specifically state that there is a relationship between menstrual pain severity and physical characteristics of individuals. In this relationship, the most emphasized physical features are low body weight and body mass index⁹.

In studies investigating the effect of physical activity on menstrual pain, it has been reported that regular physical activity accelerates uterine blood flow and relieves menstrual pain. Exercises performed in the treatment of dysmenorrhea are mostly isometric exercises, aerobic exercises, stretching, flexibility, relaxation, strengthening and pilates exercises¹⁰. Lower abdominal pain is due to increased prostaglandin levels. It is stated that exercise

decreases menstrual pain and uterine rhythmic and uncoordinated contractions by increasing betaendorfin release and suppressing the amount of prostaglandin¹¹. During these periods, anxiety and unwillingness to participate in physical activities may arise in women. In addition, the menstrual cycle is not a disease, but a natural fact that the organism routinely performs. While the effect of the menstrual period on performance is still discussed, it is known that world and European records were broken during this period¹². Ertaş and Ersöz, as a result of the performance tests they performed on 28 female athletes with 14 regular and 14 irregular menstruation, found the best grades of the athletes at the beginning of menstruation¹³.

In this study, based on all this information, it has been tried to determine how women archers spend their menstrual periods in terms of pain, which methods they cope with pain, and how they feel themselves during their menstrual periods. In addition, it was investigated whether there is a relationship between pain, pain level and BMI, body weight and age at menarche.

MATERIAL AND METHODS

Participants: The study included a total of 142 women

participated in the 2020 archery archers competed in the Turkey championship. Participation was on a voluntary basis. The average age of the participants is 25.21 years.

Data collection: Kishahli et al. and Atan et al. by used a questionnaire containing questions about the menstrual cycle previously^{14,15}.

Statistical analysis: The data measured in this study were used in the SPSS 23.00 statistical program. Chi square and Pearson correlation test was used in statistical calculations. The level of significance was taken as $p < 0.05$.

43-63 points are medium, 64-84 points are high, 85-105 points are ideally high, and they have an attitude towards healthy eating.

RESULTS

Table 1. Height, body weight, body mass index and average age of onset of menstruation of the archers

	Mean	St.deviation
Age (Year)	25,21	7,57
Height (cm)	167,30	6,25
Body weight (kg)	59,70	9,82
Body mass index (kg/m ²)	21,29	3,06
Beginning age of menstruation (Year)	13,27	1,19

Table 2. How many days and hours of sports per week by age category

Age categories		How many days a week sports				How many hours of sports			
		2 day	3 day	4 day	5 days or more	1 hour	1,5 hour	2 hour	2 hour or more
15-18 age	n	1	7	6	16	3	1	16	10
	%	3,3	23,3	20,0	53,3	10,0	3,3	53,3	33,3
19-25 age	n	9	15	10	17	10	4	23	14
	%	17,6	29,4	19,6	33,3	19,6	7,8	45,1	27,5
26 age and older	n	15	17	11	18	13	10	26	12
	%	24,6	27,9	18,0	29,5	21,3	16,4	42,6	19,7
Total	n	25	39	27	51	26	15	65	36
	%	17,6	27,5	19,0	35,9	18,3	10,6	45,8	25,4
Chi-square 8,80 p=0,185					Chi-square 7,41 p=0,284				

35.9% of the archers do sports for 5 days or more a week. Those who stated their daily exercise hours as 2 hours are 45.8% (Table 2). According to age category, there was no significant difference between the weekly exercise days and the amount of hours they exercise ($p > 0.05$).

Table 3: Pain status and pain level during menstruation by age category

Age categories		Pain status			Pain level		
		There is pain	No pain	Sometimes there is pain	Mild	Middle	Severe
15-18 age	n	24	0	6	5	16	9
	%	80,0	0,0	20,0	16,7	53,3	30,0
19-25age	n	36	2	13	7	23	21
	%	70,6	3,9	25,5	13,7	45,1	41,2
26 age and older	n	34	1	26	12	27	22
	%	55,7	1,6	42,6	19,7	44,3	36,1
Total	n	94	3	45	24	66	52
	%	66,2	2,1	31,7	16,9	46,5	36,6
Chi-square 7,72 p=0,102					Chi-square 1,64 p=0,804		

Archers stated that there was pain during the menstrual period with 66.2%, and this pain was moderate in 46.5% (Table 3). Pain condition and pain level are similar during menstruation according to age category ($p > 0.05$).

Table 4. Pain status and pain level during menstruation according to Body Mass Index

BMI Categories		Pain status			Pain level		
		There is pain	No pain	Sometimes there is pain	Mild	Middle	Severe
17-19 age	n	14	8	14	3	24	9
	%	38,9	22,2	38,9	8,3	66,7	25,0
20-24 age	n	59	1	29	17	40	32
	%	66,3	1,1	32,6	19,1	44,9	36,0
25 age and older	n	15	0	2	1	5	11
	%	88,2	0,0	11,8	5,9	29,4	64,7
Total	n	88	9	45	21	69	52
	%	62,0	6,3	31,7	14,8	48,6	36,6
Chi-square 27,22 p=0,000**					Chi-square 11,99 p=0,017*		

According to the body mass index, the state of pain and the level of pain during menstruation change significantly ($p < 0.05$ and $p < 0.001$)

All of those with a body mass index of 25 and above have constant or sometimes pain during the menstrual period. Again, the pain level of this group is moderate and severe.

Table 5. Menstrual period disorders by age categories

Age Categories		Pain, weakness, irritability	Lack of coordination and loss of strength	All	Chi-square
17-19 age	n	9	7	14	3,63 P:0,457
	%	30,0	23,3	46,7	
20-24 age	n	26	7	18	
	%	51,0	13,7	35,3	
25 age and older	n	28	10	23	
	%	45,9	16,4	37,7	
Total	n	63	24	55	
	%	44,4	16,9	38,7	

While 44.4% of the archers had menstrual disorders, pain, weakness and nervousness were detected in 16.9% of them, lack of coordination and loss of strength were detected in 38.7% of them were all present. (p> 0.05).

Table 6. The state of feeling yourself just before the menstrual period, during menstruation and 3 days after the onset of bleeding compared to the normal situation

Age Categories		Just before the menstrual period				During menstruation according to the normal situation				3 days after the bleeding starts			
		Better	Good	Same	Worse	Better	Good	Same	Worse	Better	Good	Same	Worse
17-19 age	n	0	14	9	7	0	2	2	26	1	7	19	3
	%	0,0	46,7	30,0	23,3	0,0	6,7	6,7	86,7	3,3	23,3	63,3	10,0
20-24 age	n	1	14	16	20	1	9	9	32	6	18	22	5
	%	2,0	27,5	31,4	39,2	2,0	17,6	17,6	62,7	11,8	35,3	43,1	9,8
25 age and older	n	1	13	20	27	5	9	15	32	16	16	21	8
	%	1,6	21,3	32,8	44,3	8,2	14,8	24,6	52,5	26,2	26,2	34,4	13,1
Total	n	2	41	45	54	6	20	26	90	23	41	62	16
	%	1,4	28,9	31,7	38,0	4,2	14,1	18,3	63,4	16,2	28,9	43,7	11,3
Chi-square 7,49 p=0,278					Chi-square 13,08 * p=0,042					Chi-square 12,84* p=0,046			

In this study, no statistically significant difference was found between the states of feeling oneself just before the menstrual period according to age categories (p> 0.05). A statistically significant difference was found between the state of feeling oneself during menstruation and 3 days after the onset of bleeding compared to the normal state (p <0.05).

Table 7. Using drugs for delaying menstruation by age category

Age Categories		Training period		Chi-square	Competition period		Chi-square
		Yes	No		Yes	No	
17-19 age	n	13	17	4,71 p=0,31	15	15	3,06 p=0,22
	%	43,3	56,7		50,0	50,0	
20-24 age	n	11	40		23	28	
	%	21,6	78,5		45,1	54,9	
25 age and older	n	20	41		20	41	
	%	32,8	67,2		32,8	67,2	
Total	n	44	98		58	84	
	%	31,0	69,0		40,8	59,2	

While 31.0% of the archers stated that they use menstrual retarder during training periods, although this rate rises to 40.8% during the competition / competition period, 59.2% of them do not use retarders during the competition period. There was no statistically significant difference in the use of drugs for menstrual delay according to age category (p> 0.05).

Table 8. Using pain relieving drugs and dietary supplements during menstruation according to age category

Age Categories		Using pain relieving medication during menstruation			Using any nutritional supplement during menstruation		
		Yes	Sometime	No	Yes	Sometime	No
17-19 age	n	6	20	4	3	16	11
	%	20,0	66,7	13,3	10,0	53,3	36,7
20-24 age	n	20	27	4	19	17	15
	%	39,2	52,9	7,8	37,3	33,3	29,4
25 age and older	n	19	29	13	10	28	23
	%	31,1	47,5	21,3	16,4	45,9	37,7
Total	n	45	76	21	32	61	49
	%	31,7	53,5	14,8	22,5	43,0	34,5
Chi-square 7,05 p=0,133				Chi-square 10,60 p=0,032			

There is no statistically significant difference in the use of pain relieving drugs during the menstrual period according to age category (p> 0.05). However, a statistically significant difference was found in the use of nutritional supplements during menstruation according to age category (p <0.05).

A significant correlation was found between body weight and pain and pain level during menstruation (p <0.01). Similarly, a relationship was found between body mass index and pain and pain level during menstruation. (p

<0.05). Although body weight and body mass index increase, the level of pain during menstruation has decreased, according to Table 4, this relationship is valid for those with a body mass index up to 25. As the body

weight and body mass index increase, the level of pain increases. According to the age of menarche, a meaningful relationship was determined regarding pain in the menstrual period ($p < 0.05$). As the age of menarche is delayed, the pain exposed decreases with age. No relationship was found between age at menarche and pain level.

Table 9. Relationship between body weight body mass index and menstrual pain and pain level

	Menstrual pain	Pain Level
Weight(kg)	-,186*	,222*
Body Mass Index (kg/m ²)	-,236*	,185*
Menarche Age (year)	-,197*	,067

DISCUSSION AND CONCLUSION

It is stated that the menarche is seen before the age of 10 as early, and the transition to after the age of 16 as late¹⁶. Menstrual bleeding starts between the ages of 9-16, but the age of menarche occurs later in young girls who play sports and who are weaker than their normal peers¹⁷. In 2006, in the guideline published by the American Pediatric Association and the American Academy of Gynecology and Obstetrics, it was reported that the age of menarche should be between 11-14 years in order for a menstrual cycle to be considered normal¹⁸. The elongation attack starts between the ages of 9.5-14 in girls. Girls reach their peak growth rate at the age of 12 on average. Average growth spurt in adolescent girls occurs about 1 year before the onset of breast development. After 1.1 years, there is a peak height speed and a menarche after an average of 1 year¹⁹. The average age of the female archers participating in this study was determined as 25.21 years, their average height was 167.30 cm, their body weight was 59.70 kg, their body mass index mean value was 21.29 kg / m², and the average age of onset of menstruation was 13.27 years (Table 1). There is no delay in the menarche ages of the athletes in our study.

Menstruation has a significant impact on women. Some uneasiness felt during this period inevitably affect the course of sports activity. Menstruation varies depending on the person, organism, environment and climate. Menstruation is not a disease but a natural course of the organism¹⁷. In the guideline published by the American Pediatric Association and the American Academy of Gynecology and Obstetrics, it is stated that cycle intervals should be between 21-45 days, and the amount of menstrual bleeding should be 3-6 pads or less per day for 7 days. Any condition outside of these ranges was evaluated as abnormal uterine bleeding¹⁸. It has been revealed that the negative effects of menstruation are more intense in women whose organism, hormones and psychological structure are different. Studies have recorded that menstruation does not have a significant effect on the organism and that women can easily participate in sports activities, and even many famous athletes received important awards in this period¹⁷. 35.9% of the archers do sports 5 days or more a week. Those who stated their daily exercise hours as 2 hours were the most with 45.8% (Table 2). According to age category, there was no significant difference between the weekly exercise days and the amount of hours they exercise ($p > 0.05$). According to

these results in our study, it is thought that the participants did not have a problem with participation in sports during their menstrual period or had to participate in training.

In the study of Pitangui et al. when looking at mild, moderate, and severe pain; It was found that the severe menstrual pain group was around 52% of the entire population²⁰. In a study conducted by Ünsal et al. it was reported that two-thirds (66.2%) of the individuals were in the moderate menstrual pain group²¹. Özerdoğan et al. found that approximately one fifth of university students had severe menstrual pain in their study²². Similarly, a study stated that 19% of the participants were in the mild menstrual pain group, 39.9% in the moderate, and 41.1% in the severe menstrual pain group²³. In this study, the archers stated that there was pain in the menstrual period with 66.2% and this pain was moderate with a rate of 46.5% (Table 3). Pain condition and pain level are similar in the menstrual period according to age category ($p > 0.05$). In our study, it is observed that more than half of the participants had a painful menstrual period. However, the level of pain they describe is moderate.

It was found that among the most frequently reported complaints of Dysmenorrhea, mood changes, fatigue, anxiety and abdominal bloating. Wong and Khoo reported that irritability, mood swings, and tension were the most frequently reported effective symptoms²⁴. Çınar, when looking at the symptoms that can be seen together with menstrual pain, 22.91% had headache, 12.79% had vomiting, 58.03% had fatigue, 10.11% had constipation and stated that 34.82 had diarrhea²³. Küçük and Özgider, in the survey they conducted on 72 volunteer female volleyball players, the athletes' menstruation; They reported that it affected their daily life and physical performance²⁵. Çolakoğlu et al. investigated the relationship between exercise - menstruation and training age - menstrual cycle pattern in their survey study on 56 active female volleyball players, and as a result, they found that exercise did not affect menstruation and that menstruation psychologically affected sports activity²⁶. In another study, they showed that there was no difference in anaerobic power between the menstrual period and the luteal period after the Wingate test in moderately active women, both in those with normal menstrual cycles and in those using oral contraceptives²⁷. In this study, 44.4% of archers had pain, weakness and nervousness, 16.9% lack of coordination and loss of strength, and 38.7% had all of them (Table 5). There was no statistically significant difference between the menstrual disorders according to age categories ($p > 0.05$). In studies investigating the effect of physical activity on menstrual pain, it has been reported that regular physical activity accelerates uterine blood flow and relieves menstrual pain. It is also stated that exercise decreases menstrual pain and uterine contractions by increasing beta-endorphin release and suppressing the amount of prostaglandins²⁸. In our study, no statistically significant difference was found between the states of feeling oneself just before the menstrual period according to age categories ($p > 0.05$). A statistically significant difference was found between the state of feeling oneself during menstruation and 3 days after the onset of bleeding compared to the normal state ($p < 0.05$). We think that physical activity reflects the positive effect of physical activity on menstrual pain, as the

participants do not take a break from training during their menstrual periods and continue to train actively for at least 2 hours per day during these periods.

Regarding the use of analgesics to control dysmenorrhea, 62.4% of the participants reported using mostly non-steroidal anti-inflammatory drugs, while 87.2% achieved minimal to complete pain relief. It has been reported to be significantly more effective than placebo in relieving pain in women with anti-inflammatory dysmenorrhoea¹¹. Polat and Çelik stated that the use of pain medications for menstrual pain varies between 42% and 71% in studies on drug use in dysmenorrhea²⁹. Considering the methods of coping with pain in the literature, it was found that 80% of the patients with moderate or severe menstrual pain used analgesics to relieve pain, according to the severity of pain in the menstrual period³⁰. In our study, there was no statistically significant difference in the use of pain relieving drugs in the menstrual period according to age category ($p > 0.05$). However, a statistically significant difference was found in the use of nutritional supplements in the menstrual period according to age category ($p < 0.05$) (Table 8). In addition, it was stated that nutritional differences, psychological and different individual differences may cause female athletes to perform differently during their menstrual periods³¹. For this reason, it is thought that the participants in our study changed their diet while struggling with pain during their menstrual periods. Mohammadi et al. also examined the effect of aerobic exercise on some menstrual symptoms of non-athletic students and concluded that regular and continuous aerobic exercise can control dysmenorrhea and severe menstrual bleeding³². However, while 31.0% of the participants in our study stated that they used menstrual retarder during training periods, although this rate increased to 40.8% during the competition / competition period, 59.2% did not use retarders during the competition period (Table 7). There was no statistically significant difference in the use of drugs for menstrual delay according to age category ($p > 0.05$). In this study, it is thought that those who do not use retardants when the menstrual period coincides with the competition, probably because they do not feel bad and do not have problems in coping with pain.

When looking at the studies examining the relationship between body weight of individuals and the severity and prevalence of pain, it is stated that the prevalence of dysmenorrhea is significantly higher in women with low body weight than in women with a higher rate. In parallel with this, according to the multivariate analysis results of the studies, it was found that the risk of dysmenorrhea was 1.5 times higher in women with low body weight compared to overweight women³³. Ünsal et al. stated in their study that the BMI of 71.9% of the individuals with menstrual pain was within normal limits²¹. In our study, a significant relationship was found between body weight and menstrual pain and pain level ($p < 0.01$). Similarly, a relationship was found between body mass index and pain and pain level during menstruation. ($p < 0.05$). Although body weight and body mass index increase, the level of pain during menstruation has decreased, according to Table 4, this relationship is valid for those with a body mass index up to 25. As the body weight and body mass index increase, the level of pain also increases (Table 9). Many

studies have found that the prevalence of dysmenorrhea decreases with age, indicating that primary dysmenorrhea peaks in late adolescence and early 20s, and its incidence decreases with age^{34,35}. In the study conducted by Montero et al. on 495 Moroccan women, the age of menarche is stated as a factor affecting the menstrual pain in individuals³⁶. In a study conducted in India, it was stated that the frequency of dysmenorrhea is lower when the age of menarche is 14 and above³⁴. Çakır et al. did not find a relationship between the probability of dysmenorrhea and the age of menarche in their study on 480 people⁷. However, they stated that individuals with severe menstrual pain have a higher menarche age than individuals with mild to moderate menstrual pain. In our study, a significant relationship was found between menarche age and menstrual pain ($p < 0.05$). As the age of menarche is delayed, the pain exposed decreases with age. There was no relationship between age at menarche and pain level. The blood leptin level decreases with the decrease in body fat ratio and this causes the delay of the menarche. It has been observed that vigorous physical activity (at least 2 hours a day) is related to the delay in menarche. Increased physical activity has an effect on menarche with a change in energy balance and body composition³⁷.

As a result, it was found that the competitor archers who participated in our study suffered pain during the menstrual period and their pain levels were moderate. Patients with late menarche experience less pain than those with early menarche. However, it is thought that delaying the age of menarche with regular physical activity, which will be planned for at least 2 hours a day, will contribute positively to the height growth and will be less exposed to dysmenorrhea, which decreases as the age increases with late menarche. In order for athletes to deal effectively with their dysmenorrhea complaints, necessary information should be given first. In addition, it is necessary to provide individual counseling to the athletes who need it, while ensuring that they are made aware of getting medical help when necessary. Because it should not be forgotten that the painkillers and menstrual delay drugs used by athletes with their own methods may have different damages.

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