

THE CONNECTION OF MENARCHE BETWEEN SPORTSWOMEN AND THEIR MOTHERS

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Abstract

The aim of the research is to determine whether there is difference in the age at menarche between daughters and their mothers, whether there is difference in terms of discomfort which is related to training (before, during and after menstruation) and whether there is mitigation of the menstrual symptoms among sportswomen who train actively in comparison to the period when they did not train actively. The research has been carried out on sportswomen from the Judo Club "Pujanke" from Split, Croatia, at the age from 12 to 17 (+/- 6 months) and their biological mothers. Two anonymous closed type questionnaires were given to the respondents. The first questionnaire consisting of 19 questions was given to the sportswomen and the second one consisting of 18 questions was given to their mothers. The questionnaire which was given to the sportswomen included questions about their menarche and the symptoms, and questions about their physical activity. The questionnaire which was given to their mothers had instructions on how to answer the questions; the questions should be answered in two ways: for 'the past' and for 'today'. 'The past' refers to the period when the mothers were the same age as their daughters are today. The questionnaire includes questions about their menarche and the symptoms, and questions about their physical activity in the past and today. In the research, the ratio is calculated with χ^2 test for both samples, as well as their representation in terms of frequency for each question. From the results, we can conclude that the average age at menarche among sportswomen is 12, regarding their mothers, for almost half of them, the age at menarche is 12 and 14. 46.67% of the sportswomen do not experience painful menstruation, therefore 93.33% attend training during menstruation. Only a small percentage of the respondents wrote that the discomfort and the menstrual bleeding affected their competition results.

Key Words: menarche, questionnaire, sportswomen, judo, χ^2 test

POVRZANOST NA MENARHATA ME\U

SPORTISTKITE I NIVNITE MAJKI

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Анстракт

Целта на истражувањето е да се утврди, дали постои разлика во однос на возраста кога добиле менарха помеѓу ќерките и нивните мајки. дали постојат разлики во однос на тегобите, а кои се поврзани со тренингот (пред, за време, по менструација) и дали постои намалување на симптомите поврзани со циклусот кај спортистките кои тренираат активно во споредба со периодот кога не тренирале. Истражувањето е спроведено на спортистки од џудо клубот „Пујанке“ од Сплит, Хрватска на возраст од 12 до 17 години (+/-6 месеци) и нивните биолошки мајки. На примерокот на испитаници беа применети два анонимни анкетни прашалници од затворен тип. Едниот анкетниот прашалник го пополнуваа спортистките и содржеше 19 прашања, а другиот анкетен прашалник го пополнуваа мајките на спортистките и се состои од 18 прашања. Анкетниот прашалник на спортистките содржи прашања за нивната менарха и нејзините симптоми, но и во однос на нивната физичка активност. Додека во анкетниот прашалник на мајките беше наведено дека тие треба да одговараат на прашањата на два начина за „некогаш“ и за „денес“, каде „некогаш“ претставува нивната состојба на годините кои нивните ќерки ги имаат денес. Прашањата се исто така поставени во однос на нивната менарха и нејзините симптоми, но и во однос на нивната физичка активност некогаш и денес. Во истражувањето односот е пресметан со χ^2 тест за двата примероци, како и нивната застапеност со фреквенција за секое прашање. Од добиените резултати може да каже дека спортистките во просек добиваат менарха на 12 година од својот живот, а нивните мајки скоро на половина од нив добиле менарха на 12 и на 14 години. Кај 46,67% од спортистките менструацијата не е болна и затоа дури 93,33% од нив тренираат додека имаат менструација. Кај мал процент од испитаниците тегобите и крварењето влијаат на резултатите на натпреварите.

Клучни зборови: менарха, анкетен прашалник, спортистки, џудо, χ^2 тест

Introduction

A large number of girls in the world are aware of the fact that the symptoms of the menstrual cycle vary individually. Some girls do not experience any kind of symptoms, whereas others suffer from strong premenstrual and menstrual symptoms. Moreover, the changes in training performance during the menstrual cycle can vary individually. The changes in training occurring in one month are considerable for a lot of girls, whereas for others, the changes are not noticeable. There are a lot of girls who win Olympic medals during menstruation but, on the other side, there are girls who feel light discomfort in their bodies and they are incapable of reaching their own limits.

The research by Петрушевска Л., and Шукова Стојмановска Д. (2011) carried out on a sample of 264 students, from 4th to 8th grade, at the age from 10 to 14 (+/- 6 months), aiming at determination of the frequency, the characteristics and the positions regarding menarche among female students at the age from 10 to 14, resulted in the following conclusions: the age at menarche has moved to younger age, female students usually have regular and normal menstruation. In addition, the lack of information about their first menstruation has led to a situation where female students who are menstruating are inactive at Physical and Health Education classes despite the fact that they have regular and normal menstruation.

Premenstrual syndrome (PMS) is a cyclic phenomenon consisting of different kinds of discomfort which is usually experienced 5-10 days before menstruation. The symptoms and their intensity are different. The most common symptoms are: anxiety, irritability, enhanced psychological sensitiveness, crying, constant hunger, bloating, tender breasts, craving for sweet food. Additionally, there are other symptoms which can occur often: acne, headache, pain in the throat, nausea, rash, pain in the lower part of the spine, stomachache etc. Premenstrual pain usually stops on the first day of the menstruation. During that period, sportswomen generally show lower level of motivation for training and their sleep might be restless which could lead to collecting more water in the body and therefore greater body weight as well as lower energy.

Hewett T.E., et all. (2005), tried to understand the reason for the bigger number of injuries among girls during menstruation and they came to the conclusion that their knees move differently during menstruation in comparison to their mobility during ovulation which is a result of bad muscles control during menstruation. Nevertheless, the authors believed that the neuromuscular control could become

better with training and they managed to ease the weight on the knees and joints and to strengthen and improve the coordination on both sides of the female body. After the implemented procedures women experienced fewer knee injuries by 50 to 60%.

The research conducted by Adair L.S. (2001) in the Philippines, included several thousand girls who were followed from their birth to the age of 15. They analyzed their growth and development (weight, length and later, height), the age of the first menstruation, the socioeconomic conditions, the diet, the age at menarche of the mothers and their weight gain during pregnancy as well as their diet. The author came to the conclusion that the girls who lived in the cities in better socioeconomic conditions, in better-off families and those who had more educated mothers – had earlier age at menarche (12.1 on average, and between 12.4 and 13.9). It is interesting that this research showed that the weight at birth could affect the age at menarche of girls. So, the babies who were long (> 49cm), and thin (<3 kg) had menarche earlier than baby girls who were short (<49 cm) and thin (<3 kg). The effect of the birth weight of the girls on the age at menarche is even greater if we take into consideration the weight of the mother before giving birth. This means that the growth and development of the baby is determined intrauterine.

Material & methods

Participants

In this research the sample of respondents are the sportswomen from the Judo Club “Pujanke” from Split, Croatia, at the age from 12 to 17 (+/- 6 months) and their biological mothers. This sample of respondent is divided into two subsamples based on whether the sportswomen have had menarche or not. The first subsample consists of 15 sportswomen who have had menarche and their 15 mothers, while the other subsample consists of 5 sportswomen who have not had menarche and their 5 mothers.

Questionnaire

The questionnaire was conducted in the period from 22-30.11 2018. The mothers signed consent forms for the questionnaires for their daughters. Two anonymous closed type questionnaires were given to the respondents. The first questionnaire consisting of 19 questions was given to the sportswomen and the second one consisting of 18 questions was given to their mothers. The questionnaire which was given to the sportswomen included questions about their first menarche, the frequency and the symptoms their bodies experience before, during and after the menstrual cycle, as well as questions about their physical training, i.e. how many times a week they have training sessions, how long the training sessions last and if they feel any kind of symptoms or changes in their bodies before, during and after the menstrual cycle when they train and compete. It should be mentioned that sportswomen who had not had their first menstruation did not answer questions (2,3,4,5,6,7,13,14,15,16,17,18 and 19) about menstruation, they answered only questions about their training. The questionnaire which was given to their mothers had instructions on how to answer the questions; the questions should be answered in two ways: for ‘the past’ and for ‘today’. ‘The past’ refers to the period when the mothers were the same age as their daughters are today. The questionnaire includes questions about their menarche and the symptoms, and questions about their physical activity in the past and today. Further analysis will be carried out regarding the answers of the mother who menstruated when she was same age as her daughter is today.

Statistical analysis

The results of the anonymous questionnaire are calculated with the representation of frequency in percentage and χ^2 test for each question.

Purpose of the research

The aim of this research is to find out:

- if there is difference in the age at menarche between daughters and their mothers;
- if there is difference in the discomfort related to training (before, during and after menstruation)
- if there is mitigation of the menstrual symptoms among sportswomen who train actively in comparison to the period when they did not train actively.

Results

The results from the questionnaire calculated with the representation of frequency and χ^2 test are shown in two tables divided according to the defined subsamples, i.e. based on whether the respondents have had menarche or not. The data and the results of the respondents who have had menarche and their mothers are shown in Table 1 and the results of the respondents who have not had menarche and their mothers are shown in Table 2. In the discussion about the results we will pay more attention to the frequency of the answers.

Table 1. Questions and frequency of the answers from the anonymous questionnaire for the **sportswomen who have had menarche** and their mothers calculated with χ^2 test.

*legend of Table 1

-in the question column, the questions written in black were given to the daughters, but they were also given to the mothers; if there are two questions (in black and in red), the question in red was given to the mothers. Mothers answer all questions about the time when they were the same age as their daughters are now and today

Questions Daughters who have had menarche	Possible answers	Number		Percentage (%)		χ^2 test	r
		daughters	mothers	daughters	mothers		
1. Do you menstruate?	yes	15	15	100	100	15	.00
	no	0	0	0	0		
Total		15	15	100	100		

3. How many days does it last?	less than 3 days	0	0	0	0	19.6	.00
	from 3-7 days	13	12	86.67	80		
	more than 7 days	2	3	13.33	20		
Total		15	15	100	100		
8. Are you an athlete?	yes	15	7	100	46.67	10.91	.00
*8.Were you an athlete?	no	0	8	0	53.33		
Total		15	15	100	100		
10. How long have you been training?	3 years	2	1	13.33	6.67	16.87	.03
	4 years	3	2	20	13.33		
	* 10.How long did you train?	5 years	2	0	13.33	0	

	6 years	3	1	20	6.67		
	7 years	2	1	13.33	6.67		
	8 years	3	0	20	0		
	9 years	0	1	0	6.67		
	10 years	0	1	0	6.67		
	I do not train	0	8	0	53.33		
Total		15	15	100	100		

12. How long does one training session last?	30 min to 1 hour	0	/	0	/	25.8	.00
	from 1 hour to 1h and 30min	3	/	20	/		
	1h and 30min to 2 hours	12	/	80	/		
	longer than 2 hours	0	/	0	/		
Total		15	/	100	/		

*15. Do you exercise when you menstruate at present?	yes	/	9	/	60	13.53	.00
	no	/	5	/	33.3		
	I avoid exercising	/	0	/	/		
	no answer	/	1	/	6.67		
Total		/	15	/	100		

* 17. Presently, do you feel any discomfort when you exercise/do recreational activities?	yes	/	2	/	13.33	10.8	.00
	no	/	11	/	73.33		
	no answer	/	2	/	13.33		
Total		/	15	/	100		

15. How can you describe the discomfort when you menstruate and train actively in comparison to the discomfort when you menstruate but do not train actively for whatever reason (when you are not active in the training program, due to illness, injury...)?	worse	1	/	6.67	/	10	.04
	the same	6	/	40	/		
	better	1	/	6.67	/		
	reduced	1	/	6.67	/		
	no discomfort	6	/	40	/		
	other	0	/	0	/		
Total		15	/	100	/		

16. How can you describe the discomfort when you menstruate and participate in a competition in comparison to the discomfort when you menstruate and you are in training sessions?	worse	3	/	20	/	12	.02
	the same	6	/	40	/		
	better	0	/	0	/		
	reduced	0	/	0	/		
	no discomfort	6	/	40	/		
Total		15	/	100	/		
17. What are your results at competitions during the days when you bleed (especially the first days of menstruation) in comparison to the other days of the month?	worse	3	/	20	/	11.2	.00
	equally good	11	/	73.33	/		
	better	1	/	6.67	/		
Total		15	/	100	/		

Based on the results from the questionnaire for the sportswomen who have had menarche and their mothers presented in Table 1, we can say that for 11 questions there are statistically significant differences in the answers of the two subsamples, i.e. at the level of $<.01$ for questions numbered 1, 3, 8, 12, *15, *17 and 17, and at level $<.05$ for questions numbered 10, *10, 15 and 16.

Discussion

The results from questions 1 and 2 lead to the conclusion that 40% of the interviewed sportswomen experienced menarche when they were 12 years old. The age at menarche for 13% of the sportswomen was 11 and 14. Unlike the sportswomen, the age at menarche for most of their mothers, around 33%, was 14 and 26% of them answered that the age at menarche was 12. According to Milojević M., and Berić B. (1983) the menarcheal age of the mothers can affect the age at menarche for their female children. Furthermore, according to the same author, girls who are physically active begin to menstruate later although in this research there is difference in terms of the years women have spent practicing sport. However, we need to take into consideration the acceleration, or the early occurrence of menstruation which according to Medved R., et al. (1987), is 4 months every 10 years. It means that if the average age of their mothers is 40, the acceleration is 16 months i.e. a year and a half and certainly, there is the effect of the regular training which prolongs the occurrence of menarche. According to Drobnjak P. et al. (1990), due to the acceleration and the improved economic situation, puberty occurs earlier by 2.5 to 3 years in comparison to the last century. Some authors claim that the age at menarche for sportswomen is prolonged for about a year. Unlike them, other authors believe that there is no difference between girls who do sports and girls who do not do any sports.

Concerning the answers to question number 3, we can say that 86.67% of the sportswomen and 80% of the mothers answered that their menstruation lasted from 3-7 days which is considered a normal period for menstrual bleeding. 66.67% of the sportswomen and 73.33% of the mothers have regular menstruation (question 4).

46.67% of the sportswomen answered that they had painless menstruation (question number 6), and 33.33% answered that they experienced a little pain during menstruation, whereas 20% of mothers who trained when they were at their daughters' age have painless menstruation, 53.33% experience a little pain during menstruation and 13.33% have very painful menstruation. The

sportswomen and their mothers have similar intensity of menstrual bleeding (question 7), therefore 66.67% of the sportswomen and 73.33% of their mothers described the menstrual bleeding as medium, and only 6.67% of the sportswomen and 13.33% of their mothers have excessive menstrual bleeding.

Although this research has been carried out among sportswomen who train actively, they all spend different number of hours of different days on training. Using the questionnaire, we found out how much they are physically active. The answers to question 10 have revealed that the respondents – sportswomen have been training this sport (judo) from 3-8 years. 20% have been training judo for 4 years, 20% have been training for 6 years and 20% have been training for 8 years, while the rest 13.33% have been training actively (for 3 years, for 5 years, for 7 years) too. The results in Table 1 show that almost half of their mothers when they were at their daughters' age trained actively, the other half did not do any sports. 13.33% of the sportswomen attend 1-3 training sessions a week, 40% attend 3-5 training sessions a week, 26.67% attend 5-7 training sessions a week and 20% attend more than 7 training sessions in a week. 80% i.e. 12 sportswomen answered that the training sessions lasted from 1h and 30min to 2 hours and only 3 i.e. 20% answered that the training sessions lasted from 1h to 1h and 30min. It is certain that the effect of the duration of training sessions on a daily and yearly basis is great.

40% do not experience any discomfort and 40% of the sportswomen experience menstrual discomfort when they compete and train during menstruation (question 16), but only 6.67% have said that their results are worse. 73.33% of the sportswomen have the same results when they compete during menstruation in comparison to the results when they do not menstruate, 20% have worse results and only 6.67% have better results (question 17). This is very important and it should be pointed out to sportswomen and all the female students so that they do not feel afraid to exercise at Physical Education classes. Borić N. (2013), conducted research on 241 professional sportswomen. Although, 3 out of 4 sportswomen felt worse during menstruation than before menstruation, 63% of the respondents pointed out that the pain reduced during training and competitions, and 62.2% believed that their results were equally good during the bleeding and the rest of the month. According to Hristov N. (1992), 25% of the observed sportswomen showed poor performance, 25% showed better performance and 50% did not show any differences. Čupić S., Stanoević S. (1970), did research on the problem of menstrual cycle and the activity of 65 top athletes from Belgrade and Sarajevo. Based on the results, the authors concluded that during menstruation, 60 athletes trained constantly, 5 trained occasionally, 8 abstained occasionally, and only two did not train at all. In terms of the achieved results during menstruation, 14 had better results, 21 had worse results, and 30 female athletes had variable results. Kral (stated by Stojanović S. (1977)) did research on the course of the cycle of female athletes during training and competitions. He came to the conclusion that 64% of the female athletes did not show any changes in the flow of the menstruation, for 20% of the female athletes the flow of the menstruation was better but it was accompanied with discomfort and for 16% of the female athletes the menstruation was aggravated and accompanied with fatigue. Jovicević R., Stanić R. (1986), had similar results from the research they did on 45 sportswomen (15 female handball players, 10 female volleyball players, 12 female basketball players and 8 female athletes who competed in the federal league) and they concluded that neither of the sportswomen experienced disruption of the menstrual cycle.

From that perspective, it is interesting to mention the research on endurance done by Noack N., Tittel N. (1968). The authors claim that the poorest performance was recorded before menstruation, the performance was somewhat better during menstruation and the best performance was recorded right after menstruation. Kliment V. (1986) came to similar results.

Conclusion

From the set goals and the analysis of the results, the following can be concluded:

- the sportswomen's average age at menarche is 12, and the age at menarche for half of the mothers is 12 and for the other half is 14
- the respondents' menstruations last from 3-7 days which is considered as normal menstrual bleeding period. Almost half of the sportswomen answered that they had painless menstruation

- a large percentage of the sportswomen, as many as 93.33% (14 of them) train during menstruation and only one does not train during menstruation. This number of training attendance during menstruation is justified because the sportswomen answered that they did not experience any discomfort during menstruation when they trained.
- the largest percentage of 73.33% said that they had equal results, 20% said that they had worse results and 6.67% said that they had better results.
- according to the results of this question ,40% of the sportswomen experience the same discomfort when they train and when they do not, and 40% do not experience any discomfort
- the mothers of the sportswomen gave answers similar to their daughters' answers. At present, they exercise or do recreational activities regardless of the menstruation and 60% of them are active during menstruation. Hence, we can conclude that the large percentage of training attendance during menstruation depends on the advice and personal experience of the mothers who encourage their daughters to attend training sessions during menstruation.
- It can also be concluded that the discomfort before, during and after menstruation when sportswomen train or compete differs individually, and for a large number of girls the discomfort is the same when they train and compete meaning that there is no deterioration of the symptoms, the pain, the bleeding, the uneasiness of the body which accounts for the answers that they achieve equally good results on competitions during the first days of menstruation and the other days when there is no menstrual bleeding. This is very important and it should be pointed out to sportswomen and all the female students so that they do not feel afraid to exercise at Physical Education classes.

The results of this research will contribute to the allocation of volume and quality of the training, the connection and ensuring continuity of the training and the competing process, timely planning and organizing of competitions and thereby proper and more useful allocation of financial resources. Hence, the opportunity to apply the results of this research to certain theoretical knowledge and practice which will lead to improved and modernized clubs and it will make the job of sports coaches and associates in clubs easier. It will also be easier for Physical Education teachers to deal with their female students at primary schools.

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