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Original Scientific Paper

TREATMENT METHODS AND ATTITUDES TOWARDS PRIMARY DYSMENORRHEA AMONG CROATIAN STUDENTS: A CROSS-SECTIONAL STUDY

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SUMMARY – This study aimed to determine which treatment methods university students use to relieve menstrual pain. The study was conducted in April 2021 and included 861 female students at the University of Zagreb. Data were collected through an anonymous online questionnaire containing 22 questions regarding menstrual characteristics and pain management. The study found that 366 (42.5%) students asked advice from a healthcare professional regarding primary dysmenorrhea and pain management. Pharmacological methods were used by 780 (90.6%) and non-pharmacological methods by 648 (75.3%) students. Most commonly, students were advised to use these methods by their families (73.8% and 64.5%, respectively). The most common drug used to treat painful menstruation was ibuprofen (84.7%). Local application of heat (78.7%) and taking an antalgic position (75.2%) were the most common alternative methods for relieving pain. Students who perceived their pain to be more severe were usually more likely to seek advice from a health worker and use both pharmacological and non-pharmacological methods in pain management. Our study found that Croatian students were more likely to self-medicate than to seek advice from a health professional regarding painful menstruation. They use both pharmacological and non-pharmacological methods.

Key words: *Painful menstruation; Dysmenorrhea; Students; Pain management; Self-medication*

Introduction

Dysmenorrhea or painful menstruation is cramping pain in lower abdomen associated with menstrual bleeding. Primary dysmenorrhea occurs in the absence of a gynecological disorder. It is often accompanied by other symptoms such as back pain, fatigue, depressive mood, nausea, diarrhea, vomiting, and dizziness. The onset of primary dysmenorrhea is connected with the establishment of ovulatory cycles about 6-12 months after menarche[1]. Primary dysmenorrhea is caused by high prostaglandin production in the uterus right before or during menstruation, which causes myometrial contractions and strong vasoconstriction and

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consequently leads to uterine ischemia and cramping pain due to reduced blood flow. Secondary dysmenorrhea usually develops later during the reproductive period and is caused by an underlying pelvic pathology, most commonly endometriosis[2].

In the treatment of primary dysmenorrhea, both pharmacological and non-pharmacological methods can be used. The first line of pharmacological treatment are non-steroidal anti-inflammatory drugs (NSAIDs) and the second line is hormone therapy[3]. Non-pharmacological methods in the treatment of primary dysmenorrhea include local application of heat, exercise, nutritional interventions such as a low-fat diet or increased intake of omega-3 fatty acids and vitamin B, acupuncture, acupressure, and transcutaneous electrical nerve stimulation (TENS). Placing a heating pad on lower abdomen and therapeutic exercise were the only methods found to be effective in relieving menstrual pain. There is limited evidence regarding other methods[4-10].

Most young women prefer to talk about painful menstruation and seek advice on methods for relieving menstrual pain from their mothers, sisters, and friends rather than health care providers[11,12]. Accordingly, many women (18%-96%) tend to choose self-medication to relieve painful menstruation[13-15]. Studies show that most methods of self-medication, including the use of over-the-counter (OTC) drugs, are inappropriate, which can be attributed to poor information among women about the choice of an appropriate drug, therapeutic dose, and possible side effects[16].

The aim of this cross-sectional study was to obtain the attitudes toward seeking advice from health care providers and treatment of primary dysmenorrhea among female students at the University of Zagreb, Croatia.

Subjects and Methods

Study design and setting

This cross-sectional study was approved by the Ethics Committee of the School of Medicine, University of Zagreb (380-59-10106-21-111/66). It was conducted from April 13 to April 30, 2021 among female students enrolled at the University of Zagreb, Croatia, using an anonymous web-based questionnaire to acquire respective data. The interested students were informed about participation conditions through a written consent. Participation in this study was entirely voluntary and they could withdraw at any time. All information collected in this study was kept confidential.

Participants

Inclusion criteria in this study were female gender and history of primary dysmenorrhea in the preceding six months. Also, the participants had to be students at the University of Zagreb in the academic year 2020/2021. Exclusion criteria were age above 30 years and a diagnosed pelvic pathology (e.g., endometriosis, adenomyosis, pelvic inflammatory disease, cervical stenosis, cervical polyps, uterine fibroids) associated with secondary dysmenorrhea. After the application of exclusion criteria, a total of 861 responses were left for analysis.

Data collection

Data were collected through an anonymous online questionnaire which was based on previous studies and available literature[13,17]. The questionnaire contained 22 questions regarding sociodemographic and menstrual characteristics, as well as questions regarding seeking advice for relieving menstrual pain and use of pharmacological and non-pharmacological methods for pain management. Primary dysmenorrhea was defined as menstrual pain at least once in the previous six months in the absence of pelvic pathology. Menstruation-related symptoms were examined using a list of common complaints from which the students could choose those that applied to them. This list included 13 symptoms as follows: fatigue, exhaustion, depressive mood, irritability, lower back pain, muscle pain, painful or tender breasts, bloating, nausea, vomiting, diarrhea, headache, and dizziness. Heaviness of menstrual bleeding was estimated according to the number of pads or tampons used during one menstruation where the use of ≤10 pads/tampons indicated light, 11-20 pads/tampons moderate, 21-30 pads/tampons moderately heavy, and more than 30 pads/tampons heavy bleeding during one menstrual cycle[18,19]. A numerical rating scale (NRS) was used to assess the participant perceived intensity of pain. They had to mark a number between 0 and

10, where 0 is no pain and 10 is the worst pain. The score was interpreted in accordance with other studies as mild (1-3), moderate (4-6) and severe (7-10)[20,21].

The questionnaire was shared on official social media pages of student councils and mailing lists in arrangement with student representatives, and it was also distributed in private student groups on social media (e.g., Facebook, Instagram).

Statistical analysis

Scripts written in Python 3.9 programming language were used on statistical analysis. The normality of data distribution was tested using the Shapiro-Wilk normality test. Standard deviation and mean or median and interquartile range were calculated for continuous variables depending on the variable type and normality of distribution. Categorical variables were expressed as absolute number and percentage. The χ^2-test was used to compare categorical variables. The level of statistical significance was set at α=0.05.

Results

A total of 861 female students were included in the study and their responses were used on statistical analysis. Most participants were enrolled in social sciences (n=363, 42.2%), biomedicine and health (n=206, 23.9%) and natural sciences (n=125, 14.5%), and the least in biotechnical sciences (n=51, 5.9%), technical sciences (n=52, 6.0%) and humanities (n=64, 7.4%). Around 65% were from urban areas.

The median age of the participating students was 22 years with interquartile range (IQR) from 20 to 23 years. The median age at menarche was 12 years. The majority of students (n=704, 81.8%) reported having regular menstrual cycles and the menstrual cycle median was 29 days, IQR 28 to 30 days. In 861 students reporting number of days of bleeding ranged from 2 to 10 days, median 6 days, IQR 5 to 6 days. The heaviness of menstrual flow was estimated by the number of pads/tampons used during menstruation. According to that, 42 (4.9%) students reported to have light, 442 (51.3%) moderate, 318 (36.9%) moderately heavy, and 59 (6.9%) heavy bleeding. The median number of menstruation-related symptoms was 5, IQR 3-7. Most common were bloating (64.8%), painful or tender breasts (61.3%), fatigue (60.5%), lower back pain (60.0%) and exhaustion (57.0%). Positive family history of dysmenorrhea was found in 677 (78.6%) students.

More than a half of the participants (n=573, 66.6%) visited a gynecologist and 96 (11.1%) used oral hormonal contraceptives. A total of 549 (63.8%) students perceived their pain to be severe, 248 (28.8%) stated

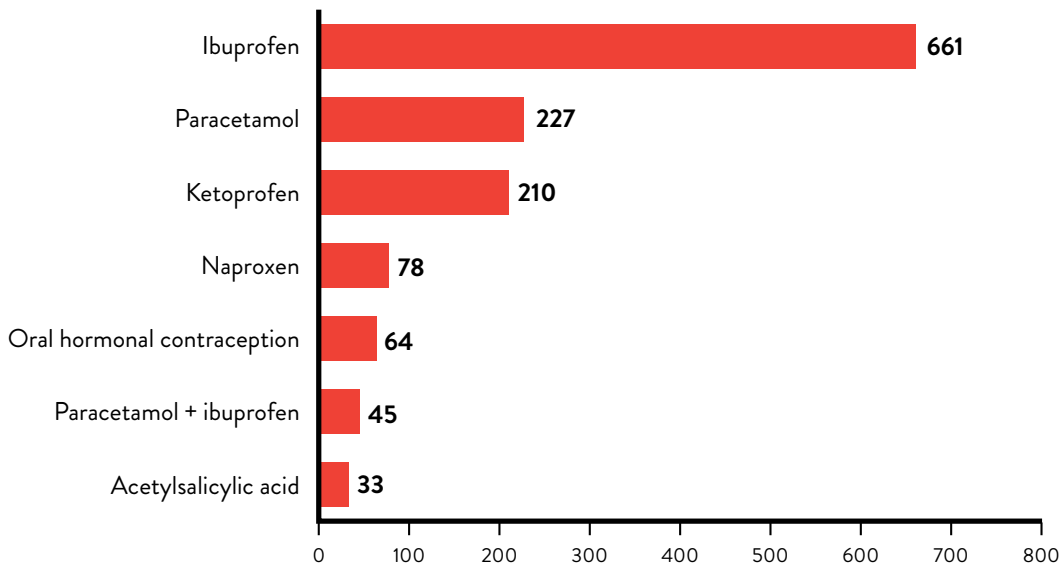

Fig. 1. Pharmacological methods used in pain management.

their pain was moderate, and 64 (7.4%) mild. Only 366 (42.5%) female students sought advice of a healthcare professional regarding their painful menstruation, and most frequently they consulted a gynecologist (n=282, 77.0%), their family doctor (n=138, 37.7%) or pharmacist (n=44, 12.0%).

A total of 780 (90.6%) students included in the study regularly used medications to relieve menstrual pain. The advice for taking medicine to relieve menstrual pain most often came from a family member (n=576, 73.8%), followed by a doctor in 326 (41.8%) and friends in 302 (38.7%) cases. Figure 1 shows the most common medications used in primary dysmenorrhea pain management. Students also stated to use other medications such as diclofenac (n=5), tramadol/paracetamol (n=3), trospium chloride (n=3), dexketoprofen (n=2), paracetamol/propyphenazone/caffeine/codeine phosphate sesquihydrate (n=2), diazepam (n=1), and paracetamol/propyphenazone/codeine phosphate hemihydrate/caffeine (n=1).

Non-pharmacological methods for relieving menstrual pain were used by 648 (75.3%) female students. Advice to use non-pharmacological methods for dysmenorrhea treatment was most often given by a family member (n=418, 64.5%). The students were advised by friends in 252 (38.9%) cases, and found advice in media in 207 (31.9%) cases. Figure 2 shows the most common non-pharmacological methods used in primary dysmenorrhea pain management.

Students also stated to use other alternative methods to relieve dysmenorrhea. The most common was the use of different sorts of tea (n=29). Some students (n=0) did not define the sort of tea they used. Students stated to use Lady's mantle tea (n=7), St. John's wort tea (n=2), herbal tea (n=2), Uva Ursi (bearberry) tea, thyme tea, lemon balm tea, natural tea, chamomile tea, medicinal tea, ginger tea and Eva's tea (tea mixture containing chamomile flower, elder flower, calendula flower, yarrow green, sage leaf and Lady's mantle green). Figure 3 shows comparison of different sources of advice for pharmacological and non-pharmacological treatment.

Our study found a statistically significant difference between students who perceived their menstrual pain to be mild or moderate and students who perceived it to be severe. Students who had severe dysmenorrhea

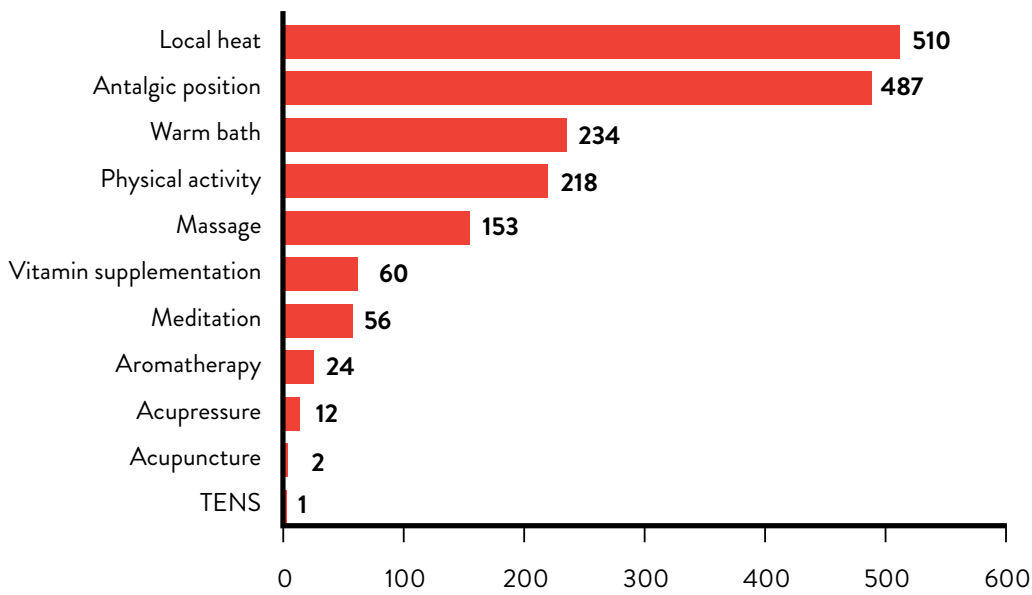

Fig. 2. Non-pharmacological methods used in pain management.

TENS = transcutaneous electrical nerve stimulation

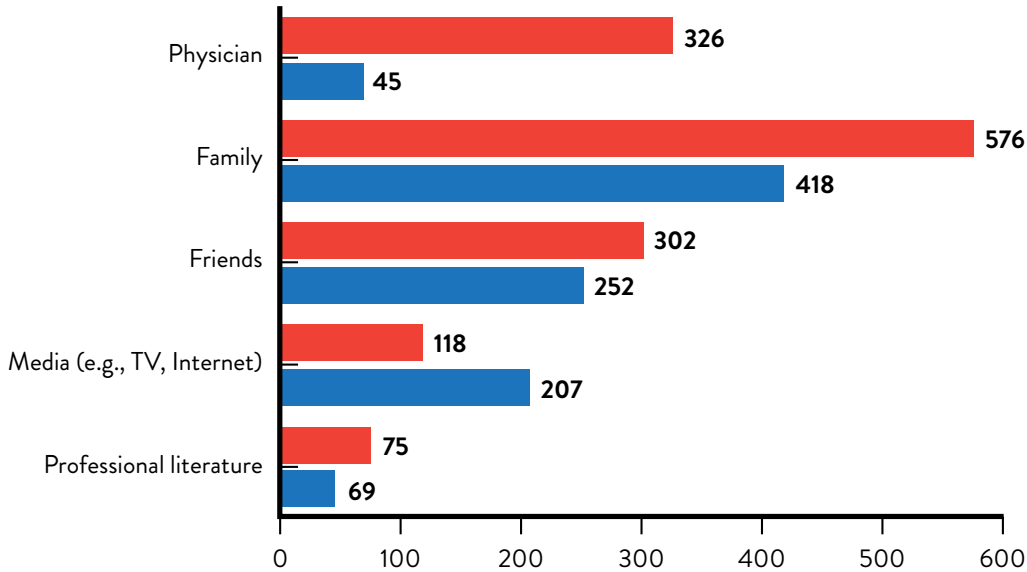

Fig. 3. Comparison of advice given by different sources for the use of pharmacological and non-pharmacological pain management.

more often had female relatives with menstrual pain (χ^2=4.543; p=0.033), more often asked for medical advice (χ^2=73.128; p<0.00) and more commonly used pharmacological (χ^2=66.776; p<0.001) and non-pharmacological (χ^2=32.724; p<0.001) methods to relieve their pain. Less use of oral hormonal contraceptives (χ^2=8.858; p=0.003) was noted in this group, which is shown in Table 1.

Discussion

Our study was the first to report menstrual characteristics among students with primary dysmenorrhea enrolled at the University of Zagreb, Croatia. It showed the student willingness to seek advice from a health professional in order to receive appropriate pain management was less than expected. Furthermore,

Table 1. Characteristics of students according to perceived intensity of menstrual pain

Variable		Pain intensity		Test value and significance of null hypothesis
		Mild/moderate (N=312)	Severe (N=549)	
Family history of dysmenorrhea	Yes No	233 (74.7) 79 (25.3)	444 (80.9) 105 (19.1)	χ^2=4.543; p=0.033
Medical advice	Yes No	73 (23.4) 239 (76.6)	293 (53.4) 256 (46.6)	χ^2=73.128; p<0.001
Use of medicine	Yes No	249 (79.8) 63 (20.2)	531 (96.7) 18 (3.3)	χ^2=66.776; p<0.001
Use of oral hormonal contraceptives	Yes No	48 (15.4) 264 (84.6)	48 (8.7) 501 (91.3)	χ^2=8.858; p=0.003
Use of alternative methods	Yes No	200 (64.1) 112 (35.9)	448 (81.6) 101 (18.4)	χ^2=32.724; p<0.001

Results are shown as absolute number (%)

students are often prone to self-medicate and usually take analgesics to reduce painful menstruation, but also practice non-pharmacological methods for relieving pain.

Most participants (42.2%) were enrolled in social sciences and least in technical sciences (6.0%) and biotechnical sciences (5.9%). The distribution of participants relating to their field of study is mostly in accordance with the distribution of female students at the University of Zagreb.

Only 366 (42.5%) students asked a healthcare professional for advice regarding pain management, which is in line with the observations of similar studies[17,22]. The frequency of consultations with health workers about dysmenorrhea and its treatment was significantly higher than in several smaller studies[14,23-25] in which it was 6.8%-16.2%, but still low considering the reported large proportion of severe menstrual pain. Previous studies[26,27] have shown that girls and young women mostly talk about their menstrual problems with their mothers, who are their main source of information regarding this topic.

Both pharmacological and non-pharmacological methods were used to relieve menstrual pain. The number of female students who regularly used drugs to relieve menstrual pain was 780 (90.6%). In other studies[12,20,27-29], it ranges from 58% to 93%. The majority of students received advice on using medication to reduce menstrual pain within their families. More than half of the participants in this study were prone to self-medication, which could cause unwanted consequences such as underdosing or side effects due to taking inappropriate drugs[12]. However, self-medication is not an uncommon practice according to other studies[13,15,30] where its frequency was 56.0%-61.7%, which corresponds to the observations in our study. Regardless of whether they were prescribed by a doctor or purchased from a pharmacy as an OTC preparation, the most frequently used active substances for dysmenorrhea treatment were ibuprofen (84.7%), paracetamol (29.1%) and ketoprofen (26.9%). In most other studies[26,31], the drug of choice was paracetamol (60.3%-85.0%). It should be noted that in this study, 33 (4.2%) students used acetylsalicylic acid to reduce menstrual pain, which is not potent enough to treat dysmenorrhea in the usual dose[32]. Fernández-Martínez *et al.* showed that the use of oral hormonal contraception as a second line treatment of primary dysmenorrhea was quite low (11.7%)[33], and in our study, it also was only 8.2%. Although it has been observed that taking contraceptives significantly reduces the prevalence of dysmenorrhea, and in women who still have dysmenorrhea, pain is significantly less[33], it is still not accepted by all women[34].

Among our participants, non-pharmacological methods were used less often than pharmacological methods, which can be attributed to inadequate information or lack of trust in such alternative methods, although some of them have proven to be effective in reducing pain and cause fewer side effects than drugs. The frequency of using non-pharmacological methods to relieve menstrual pain was 75.3%. The students were mostly encouraged to use them by their family and friends, and many of them stated that they recognized through their own experience how they could relieve dysmenorrhea. Here are some of their statements: "I instinctively feel like doing certain things (warm shower, heating pad, fetal position…)", "I myself have noticed that it helps", "I figured out myself that I needed to be warm for my stomach and back", "I discovered it by myself listening to my body", "I came up with it myself", "I have figured out what suits me". The most frequently used non-pharmacological methods were local application of heat (78.7%), taking an antalgic position (75.2%), warm bath (36.1%), and physical activity (33.6%). According to the majority of previously conducted research[17,35,36], antalgic position and local application of heat also were the most frequently used non-pharmacological methods, whereas physical activity and exercise were less often the methods of choice, their frequency was from 2% to 8%[20,24], and according to another study[28], young women preferred rest instead of movement. Compared to the research by Fernández-Martínez *et al.*, similar results were obtained regarding the use of acupuncture (0.3% *vs.* 0.9%), acupressure (1.9% *vs.* 3.5%), meditation (8.6% *vs.* 5.2%), aromatherapy (3.7% *vs.* 1.3%) and TENS (0.2% *vs.* 1.7%)[35]. A small part of students (n=29, 3.5%) stated to use different teas, among which the most common was Lady's mantle tea. Lady's mantle (*Alchemilla vulgaris L.*) is attributed antibacterial and anti-inflammatory effects due to its high content of tannins, and is used in folk medicine for the treatment of

various diseases, including dysmenorrhea[37]. Herbal and dietary therapies are popular because they can be applied independently and are widely available in healthy food stores, drugstores and supermarkets, but women must take care when using them because of dosage, quality of the ingredients, and possible interactions with other drugs in order to avoid unwanted effects[2].

Students who perceive their menstrual pain to be severe had more likely a positive family history of dysmenorrhea and were more likely to seek medical advice and use pharmacological and non-pharmacological methods to relieve painful menstruation than their colleagues who perceived their menstrual pain to be mild or moderate. They were also less likely to use oral hormonal contraceptives.

The limitations in this study were due to its structure and participant selection. Cross-sectional studies give a good insight in the studied population, but the interpretation of causality is limited. Dysmenorrhea was defined as 'painful menstruation at least once in the previous six months', which may not have been an appropriate definition and a more precise definition should be used in forthcoming studies. Given that data in this study were collected retrospectively for the previous six months, there could be a certain recall bias regarding questions related to the characteristics of the menstrual cycle, especially the intensity of dysmenorrhea. The high percentage of severe dysmenorrhea in our study could also be due to a volunteer bias because female students with more painful menstruation were more likely to participate.

This study was the first to report treatment methods among Croatian students with primary dysmenorrhea. It found that students used various pharmacological and non-pharmacological treatment methods. However, they rather use self-medication than seek advice from a healthcare professional. More studies are required to find out why students tend to self-medicate. Furthermore, it is also important to use the results obtained in this study to design material which could inform young women about effective methods for relieving menstrual pain.

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Sažetak

METODE LIJEČENJA I STAVOVI HRVATSKIH STUDENTICA PREMA PRIMARNOJ DISMENOREJI: PRESJEČNO ISTRAŽIVANJE

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Cilj ovoga istraživanja bio je utvrditi koje metode studentice rabe za ublažavanje menstrualnih bolova. Istraživanje je provedeno u travnju 2021. godine i obuhvatilo je 861 studenticu Sveučilišta u Zagrebu. Podaci su prikupljeni putem anonimnog *online* upitnika koji je sadržavao 22 pitanja vezano uz karakteristike menstruacije i metode liječenja bolova. Istraživanje je pokazalo da je 366 (42,5%) studentica tražilo savjet zdravstvenog djelatnika u vezi liječenja primarne dismenoreje. Farmakološke metode rabilo je 780 (90,6%), a nefarmakološke metode 648 (75,3%) ispitanica. Studentice su preporuke u vezi primjene ovih metoda najčešće dobivale od članova obitelji (73,8% odnosno 64,5%). Od medikamentne terapije za bolne menstruacije najčešće je korišten ibuprofen (84,7%). Lokalna primjena topline (78,7%) i zauzimanje antalgičnog položaja (75,2%) bile su najčešće primjenjivane alternativne metode ublažavanja bolova. Studentice koje su navele da doživljavaju bolove jačeg intenziteta češće su tražile savjet zdravstvenog djelatnika i rabile farmakološke i nefarmakološke metode u liječenju boli. Naše je istraživanje pokazalo da su hrvatske studentice sklonije samoliječenju nego traženju savjeta zdravstvenog djelatnika u vezi s bolnom menstruacijom, a za ublažavanje bolova rabe farmakološke i nefarmakološke metode.

Ključne riječi: *Bolne menstruacije; Dismenoreja; Studenti; Liječenje boli; Samoliječenje*