

# Analysis of the Characteristics of the Ovarian-Menstrual Cycle in Female Students Engaged in Physical Education and Sports at the University

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Submitted: 2025, May 05; Accepted: 2025, Jun 04; Published: 2025, Jul 09

**Citation:** Bugaevsky, K. A. (2025). Analysis of the Characteristics of the Ovarian-Menstrual Cycle in Female Students Engaged in Physical Education and Sports at the University. *J Nov Psy*, 5(1), 01-03.

## Annotation

The article presents research materials relating to the study of the individual characteristics of the menstrual cycle in university students, youths involved in various sports. It was found that most students have different types of menstrual irregularities, often accompanied by somatic manifestations of premenstrual syndrome. The relationship of the existing menstrual irregularities with the start of various sports was revealed.

**Keywords:** Female Students, Adolescence, Ovarian-Menstrual Cycle, Physical Education, Sport, Premenstrual Syndrome, Disorders.

## 1. Introduction

The study of any aspects related to medical and biological changes in the female body, in any age category, is always relevant and in demand. Physical education and sports are very popular types of physical activity among student youth. In addition to physical education classes at the university itself, many female students attend sports sections and clubs, where they actively train and compete in many sports. Many of them began their sports activities in the prepubertal and pubertal periods, even before their first menstruation, before puberty [2-4]. Among female students of a physical education university specializing in one or another sport, the intensity of physical and psycho-emotional stress increases significantly than that of their peers who are not so actively involved in physical education and sports [1,4-9]. The intensity of study at the university, the combination of study and sports, individual nutritional characteristics of girls, the presence or absence of a number of bad habits, the formation, maintenance and level of their reproductive health, is a very relevant topic for the study of medical, biological and psychological processes occurring in the body of this group of student youth.

### 1.1. The Purpose of the Article

The purpose of this study is to examine and comparatively analyze the characteristics of the formation and course of the menstrual cycle in female athletes who are actively involved in sports and

in their peers who are only involved in physical education at the university.

### 1.2. Hypothesis of the Article

During the preparation period for this study, its author put forward a working hypothesis, the essence of which was that young female students, both those involved in physical education during their studies at the university, and their peers, female students of the same university, who are additionally and intensively involved in various sports, have significantly pronounced differences and changes in the dynamics of their OMC.

## 2. Material and Methods

This study was conducted with the participation of 137 female students of several faculties University, Mykolaiv, Ukraine. Among them were 70 students engaged only in physical education at the university and 67 students of the faculty of physical education and sports. Student athletes are engaged in the following sports: athletics (short and middle distance running, high and long jump, team sports - volleyball, basketball, handball; martial arts - freestyle and Greco-Roman wrestling, judo). The level of sportsmanship of female athletes is from the 1st sports category to a candidate for master of sports and master of sports. The frequency of sports activities (trainings) is from 3 to 5 times a week, from 2 to 3 hours per 1 training session. Physical education classes at the university

for non-athlete students are 2 times a week, 1.5 hours per 1 session. All athletes were classified as adolescents and selected by random sampling. The average age of non-athlete female students was  $19.23 \pm 0.56$  years, and that of athlete female students was  $19.56 \pm 1.02$  years ( $p \leq 0.05$ ).

To conduct the study, we used anthropometric methods (weight and body length, pelvic and shoulder width), index method, with the determination of body mass index (BMI) and sexual dimorphism index (SDI), anonymous questionnaires to determine the characteristics of the ovarian-menstrual cycle (OMC) in girls of both groups (author's questionnaire Bugaevsky K.A., 2017-2024), literary analysis method, using available sources of information,

mathematical statistics method. All female students who took part in the study gave their voluntary, both verbal and written, consent to participate.

### 3. Results and Discussion

After conducting the questionnaire, processing the analysis of the obtained results, and an additional interview, it was revealed that female students-athletes have a greater number and variety of types and combinations of disorders of the OMC than their peers who do not play sports, but attend only physical education classes at the university. Data on the characteristics of the OMC and its disorders, obtained from female students-non-athletes ( $n = 70$ ), at  $p \leq 0.05$ , are presented in Table 1:

Name of the indicator of the identified values of the OMC	Number of detected changes in the OMC
1. Normal values of OMC; number of days of OMC in the group: $28.23 \pm 1.14$ days	19 (27,14%) female students
2. Hypomenstrual syndrome: duration of menstrual bleeding $2.36 \pm 0.65$ days; volume of menstrual bleeding - $46.17 \pm 1.19$ ml; duration of menstrual bleeding $\leq 43.65 \pm 0.45$ days	11 (15,71%) female students
3. Hypermenstrual syndrome: duration of menstrual bleeding $11.78 \pm 1.17$ days; volume of menstrual bleeding $\leq 174.58 \pm 1.07$ ml; duration of menstrual bleeding $\leq 19.89 \pm 1.13$ days	9 (12,86%) female students
4. Secondary amenorrhea (absence of menstrual bleeding for 60 to 120 days)	3 (4,29%) female students
5. Premenstrual syndrome (PMS) - its physical and psychological manifestations	28 (40,00%) female students
6. Combined disorders of the ovarian-menstrual cycle	37 (52,86%) female students

**Table 1: Identified Features of the Omc in Female Non-Athletes**

It should be noted that there is a fairly high rate of female students with normal, physiological values of their OMC – 27.14% of the entire group of non-athletes. At the same time, among them there are female students with both scanty menstrual bleeding (MB) volume – less than 50 ml for all days of MB, menstrual discharge, and short-term (less than 3 days) manifestations of OMC, and long (more than 35 days) breaks between successive MB, periods of time, which corresponds to the clinical manifestations of hypomenstrual syndrome [1-4, 6&8]. At the same time, 11 (15.71%) female non-athletes showed manifestations of PMS, both somatic (algomenorrhea) and psychological (irritability, poor sleep, aggression or depression, decreased performance and depression), manifestations of PMS. In their 9 (12.86%)

colleagues, female students who are not athletes, on the contrary, phenomena of heavy (more than 150 ml for all days of MB) menstrual discharge were revealed, sometimes with clots, frequent (less than 21 days) and prolonged (more than 7 days), which was defined as manifestations of hypermenstrual syndrome [1-4, 6&8]. At the same time, in 14 (20.00%) female students who are not athletes, both somatic and psychological manifestations of PMS were revealed.

Speaking about the identified disorders of the OMC, its volume, duration, intervals and clinical manifestations of existing disorders of the OMC in female students-athletes ( $n=67$ ), we should refer to Table 2, with the indicators presented in it, at  $p \leq 0.05$ :

Name of the indicator of the identified values of the OMC	Number of detected changes in the OMC
1. Normal values of OMC; number of days of OMC in the group: $28.23 \pm 1.14$ days	7 (10,45%) female students
2. Hypomenstrual syndrome: duration of menstrual bleeding $2.36 \pm 0.65$ days; volume of menstrual bleeding - $46.17 \pm 1.19$ ml; duration of menstrual bleeding $\leq 43.65 \pm 0.45$ days	44 (65,67%) female students
3. Hypermenstrual syndrome: duration of menstrual bleeding $11.78 \pm 1.17$ days; volume of menstrual bleeding $\leq 174.58 \pm 1.07$ ml; duration of menstrual bleeding $\leq 19.89 \pm 1.13$ days	2 (2,99%) female students
4. Secondary amenorrhea (absence of menstrual bleeding for 60 to 120 days)	14 (20,90%) female students
5. Premenstrual syndrome (PMS) - its physical and psychological manifestations	37 (55,22%) female students
6. Combined disorders of the ovarian-menstrual cycle	57 (85,08%) female students

**Table 2: Identified Features of the Omc in Female Student Athletes**

The analysis of the obtained results in female students-athletes is strikingly different from their peers, female students-non-athletes. There are significantly fewer girls with preserved OMC - only 10.45% of female students. There are four times more female students with clinical manifestations of hypomenstrual syndrome, and more than four times more female students with phenomena of hypermenstrual syndrome. Also, four times more female students with manifestations of secondary amenorrhea. Also, among female students-athletes, a greater number of girls with psychological and physical manifestations of PMS were revealed, and one and a half times more students with various, combined manifestations of OMC disorders. During the additional survey it was revealed that the existing disorders of the OMC, non-athlete students, are associated with intense psycho-emotional stress during their studies at the university, existing disorders in the diet and, with existing endocrine, somatic and gynecological diseases. Student athletes associate their existing variants of OMC disorders, first of all, with intense physical stress related to their sports activities (training regime and competition schedule), and only then, with other factors related to their studies, everyday life and health.

#### 4. Conclusions

1. It has been established that the number and types of existing disorders of the ovarian-menstrual cycle in female students-athletes dominates over the number of disorders of the ovarian-menstrual cycle identified in female students engaged only in physical education at the university.
2. The established disorders of the ovarian-menstrual cycle in female students-athletes require further, dynamic study in a larger group of students of different years.
3. Female students, both athletes and non-athletes, with existing, including combined disorders of the ovarian-menstrual cycle, require active dispensary observation by both a sports doctor and an endocrinologist and a gynecologist.
4. All provisions of the research hypothesis put forward by its author were confirmed in full.

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