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Menstrual Cycle Length in Women Ages 20-30 years in Makassar

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Abstract. Menstrual cycle is a naturally occurring mechanism in a reproductive aged woman. The ability of a woman to identify the length of a menstrual cycle is important as a basis to determine the fertile period in the subsequent menstrual cycle. This research aimed to investigate the length of menstrual cycle of women in reproductive age. A regular menstrual cycle occurs in a regular pattern of length which can range from 21 to 35 days in adults. A subsequent cycle which occurs three to five days earlier or longer than the usual pattern would still be considered as normal. Meanwhile, a menstrual cycle which occurs twice in a month or once in more than two months would be considered as irregular cycle. The method implemented was an exploratory method through which menstruation periods of woman in reproductive age were recorded in three consecutive months. The research population was Biology students who are registered in academic year 2017. The participants were students who are registered in Reproduction and Animal Development subject. The data of menstrual period were collected from four study group which consists of 101 students. The result of data analysis on a total of 171 menstrual cycle showed that the average length of participants' menstrual cycle was 30.08 days. The total of participants showed regular and irregular length of menstrual cycle was 59.41% and 42.57% respectively.

1. Introduction

Female undergraduate student is a group of adult women who aged 19-23 years. The student activities throughout the day are busy due to lectures, practicums and extracurricular activities. Some of the students are often stressed by problems of lectures, lab reports, irregular meals and daily busyness, which finally cause various complaints, such as fatigue, stomachache, dizziness and even irregular menstruation, thus affecting their reproductive health.

Reproductive health is an important issue for female students as adults who must be healthy reproductively. As teenagers, they have experienced various changes, marked by secondary sex growth, such as breast enlargement, hair growth around the genitals, and eventually menstrual blood outflow. Menstruation is the decay of the endometrium of the uterus that contains many blood vessels, where it occurs every month and lasts for approximately 3 -7 days [1]. The length of the menstrual cycle is about 28 days, but can vary between 21-35 days. The duration of menstrual release also varies, possibly also different in each age level, diet, activity pattern, which can accelerate, delay or even prevent menstruation. If women are sick, anxious or depressed, even physical exhaustion and stress

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due to work pressure can cause menstrual cycle disruption [2]. Menstrual cycle variation is related to age among women and the cause of variation of menstrual cycle is not widely known. It is also said that there is little variation in regional differences regarding menstrual patterns during reproductive life. Differences between regions can also explain differences in health risks associated with variations in menstrual function among populations [3].

Munster studied 3743 women aged 14-15 years randomly selected from Danish Country, who was asked to provide information about the pattern of menstruation during the previous year [4]. The response rate was 78%. Information from non-respondents was obtained through telephone interviews. Research data obtained from women with regular menstrual cycles showed that 95 percent of the women experienced the decreasing of menstrual cycle length from 23-35 days in 15-19 age group to 23-30 days in 40-44 age group. Only 0.5% of women with regular menstrual cycle who have menstrual cycle length of <21 days and 0.9% of the woman who have menstrual cycle length of >35 days. At least one cycle with a length of < 21 days is experienced by 18.6% of the women, whereas 29.5% of the women has experienced at least one cycle with a length of > 35 days. Menstrual cycle variation of > 14 days has been experienced by 29.3% of the women. Menstrual cycle variation of > 14 days is 2.7 times more common in women of lower social group (controlled by age) [4,5]

The results of this study confirm the definition of polymenorrhea (cycle length <21 days) and oligomenorrhea (cycle length between 36 and 90 days), since a very short or a very long menstrual cycle is rarely recorded to be occurred in longer period of time. However, high frequencies in normal populations with large variations of menstrual cycle length challenge the view that intra-individual variation of > 5 days should be considered as a sign of diseases in these women.

Based on several previous researches, the researchers conducted a study to investigate the general pattern of the average length and pattern of menstrual cycle as well as their ability to predict fertile period of woman aged 20-23 years who are active as students in Biology Department, Mathematics and Natural Science Faculty, Universitas Negeri Makassar, Indonesia.

2. Method

The research is a descriptive observational study which aims to determine the average length and pattern of menstrual cycle among female biology students, and also to assess the students' ability to predict their fertile period. The study was conducted from March to October 2017. The population is all students of Biology Department registered in academic year 2015/2016. The selection of students majoring in biology as participants of this study is because they have learned the reproduction cycle material in the subjects of Vertebrate Reproduction and Animal Development. The data were collected by observing the menstrual dates for the last three months and reporting to the researchers. The subsequent step was to calculate the students' fertile period based on their fertility calendar. Focus Group Discussion (FGD) was also conducted with the participants to confirm and to provide supporting data. The participants consist of four study groups with a total of 101 female students. The data collected were analyzed by using a table of the average length of the students' menstrual cycle, including regular and irregular menstrual cycle pattern. The calculation of fertile period is calculated based on fertility calendar.

3. Result and Discussion

Table 1. The Average Menstrual Cycle Length of Female Biology Students Aged 20-23 years

Duration (days)	Frequency	Percentage (%)
11-15	6	3.52
16-20	8	4.70
21-25	10	5.88
26-30	70	41.17
31-35	51	30.00
36-40	15	8.82
41-74	6	3.52
Number of Cycles	170	100

The results of the study in Table 1 shows a total of 170 menstrual cycles from 101 participants. The percentage of menstrual cycle length from the highest to the lowest is 26-30 days (41.17%), 31-25 days (30.00%), 36-40 day (8.82%), 21- 25 days (5.88%), 16 -20 days (4.70%), 11- 15 days (3.53%) and 41 -74 days (3.52%). The result of this study is in line with a study of adolescent's menstrual cycles in Surabaya city with the highest percentage of menstrual cycle length is 28-30 days (65%). The study also found menstrual cycle length of more than 35 days (22.5%), 22 days (7.5%), and 31-34 days (5.00%).

The Research Center of Population collected about 30.655 menstrual cycles recorded from 2.316 women. Ninety-five percent of all cycles are between 15 and 45 days. The mean and standard deviations for the number of cycles are 29.1 and 7.46, respectively. The average cycle length between 15 and 45 days is 28.1 days with a standard deviation of 3.95 days. Menstrual cycle length variability is highest in women under 25 and declines steadily to achieve a minimum age of 35 to 39. This is then followed by a slight increase in women aged 40 to 44 years. The pattern of variability by age is shown to be as good as the percentage of cycles between 25 and 31 days in length due to the standard deviation [6].

Cycle length has been negatively associated with age because it shortens the follicular phase [2,3,7]. In line with the finding in this study, Harlow showed that being overweight was associated with probability of cycles length in women, but there were no association between body mass index with outcomes in older and more diverse ethnic populations. In addition, alcohol consumption is reported to be associated with reduced cycle length in young women and changes in the dynamics of hormones [7].

Research on the relationship between demographic and lifestyle factors with the characteristics of menstrual cycles in a sample of women aged 20-44 with continuous, categorical, and multi-variable results, through several repeated statistical techniques, showed as internal consistent results. The study result is generally consistent with previous studies that excluded the data of daily urinary hormone metabolites to assess ovarian function. The results suggest that unmodified host factors, such as ethnicity, and modifiable risk factors, such as smoking, physical activity, and alcohol consumption can affect the outcome of the menstrual cycle. There are genetic and environmental factors associated with long-term disease risk [7].

Normal menstrual cycle in teenage girls, with the average age of 12.43 years, has an average menstrual cycle intervals of 32.2 days in the first gynecological year. Menstrual cycle interval is usually 21-45 days, and the menstrual rate is 7 days or less. Menstrual products used are three to six

pads or tampons per day [8]. It is further said that, the reported menstrual cycle length indicates moderate approval on the observed cycle length.

The reported cycle length slightly overestimates the cycle length approximation in this study. The difference is not explained the arithmetic mean and the geometric mean differences. It is possible that the preferences of digits explain excessive estimation because women tend to report 28-30 days as regular cycles, whereas the overall geometric averages which are centered on women's specific mean is approximately 27 days. The average duration of bleeding of 823 menstrual periods is four and six-tenths of a day. It varies from 3 to 7 days in most cases and there is no relationship between the length of the menstrual cycle and the duration of the flow shown [9].

Table 2. Menstrual Cycle Pattern Experienced by Female Biology Students Aged 20-30 Years

Menstrual Cycle Pattern	Frequency	Percentage (%)
Regular	60	59.41
Irregular	41	40.59
Number of Cycles	101	100

Table 2 shows the percentage of students' regular and irregular menstrual cycle pattern which is 59.41% and 40.59%, respectively. Although the percentage of students who experienced irregular menstrual cycle pattern is lower, but the number of the students is high enough. Several factors that may disrupt the pattern of the menstrual cycle are fatigue, irregular eating patterns, unbalanced nutritional and calories intake, and also higher stress levels experienced by the students. This condition is supported by a study conducted to assess counseling students' menstrual cycle pattern. The study found that there is a significant moderate relationship between stress and the students' menstrual cycle pattern [10].

A study on teenagers who live in a slum area of Surabaya city Indonesia, found that menstrual cycles of the teenagers were generally regular with a quite wide range of 22 – 35 days. Most of the teenagers suffered from pain before and during menstruation period. However, they did not show any health problems. It was further explained that more students experienced pre-menstruation syndrome, either with single or multiple complaints [11].

A study found an inverse significant relationship between sleep duration and menstrual cycle irregularity of Korean female adolescent [12]. Improvement of sleep duration is needed to enhance reproductive health of young women [13]. Spare time on physical activity may affect menstrual function, although a study found that the results were modified by age. High stress levels are only associated with menstruation irregularities, and not associated with duration, amount of flow, or dysmenorrhea. Therefore, other causes should be sought in young women who complain of menstrual problems before stress is assumed to be the cause [14].

A study on the pattern of U-linkage between weight change and menstrual irregularity among obese women in the Korean general population suggested that not only the proper weight management, but also weight changes, can affect the regulation of the menstrual cycle [15]. A positive association was observed between mental health problems and irregularity of the menstrual cycle among teenage Korean girls. More attention should be paid to mental health, to improve the regularity of the menstrual cycle and help prevent chronic related illnesses later in life [16].

The data in Table 3 shows the percentage of biology students' who has the ability to predict the fertile period, in which 90.09 % of the students can predict their fertile period accurately. There were only 9.90% of the students whose prediction is less accurate. Despite the difference in prediction accuracy, all students in this study has the ability to conduct prediction of fertile period. Students who have irregular menstruation pattern cannot predict their menstrual cycle accurately based on fertility calendar because the irregularity of their menstrual cycle. The ability of those students to predict fertile period is obtained from course materials of Vertebrate Reproduction and Animal Development

course. A study on newly married fertile aged women's understanding of ovulation showed that 90% of the women has no knowledge about ovulation. Only 10 % of the women have understanding of ovulation. Furthermore, it was found that the women understanding regarding menstrual cycle was categorized as informed (14%), intermediate (35%), and uninformed (56%) [17]. Accordingly, education for woman on fertility pattern is highly important to help them recognize their fertility pattern.

Table 3. Ability of Biology Students Aged 23 years to Predict The Fertile Period based on The Fertility Calendar

Prediction of Fertile Period (Ovulation)	Frequency	Percentage (%)
Accurately	91	90.09
Less Accurately	10	9.90
Inaccurately	0	0
Total	101	100

4. Conclusion

It is concluded that the average length of the menstrual cycle of woman aged 20-30 years in this study is 30.08 days, in which 59.41% have a regular cycle and 42.57% have irregular cycles. The ability of students to predict the fertile period based on fertility calendar calculated from the first day of menstruation in the last month accurately is 90.09%, less accurately 9.90% and inaccurately 0%.

This study has found that majority of participants has the ability to predict their fertile period. However, the number of participants who has irregular pattern is high enough. Accordingly, further study can be conducted to help woman with irregular menstruation cycle to predict their fertile period more accurately by combining the calendar system with the observation of salivary ferning.

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