



## General Knowledge or The Use of Menstrual Cycle Tracking App among Medical Students at Sriwijaya University

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### ABSTRACT

**Introduction.** As technology and science develop, the menstrual cycle can be known practically by using menstrual cycle tracking applications on gadgets. The many features in the application are an added value, so many women choose to use menstrual cycle tracking applications compared to other platforms. This research aims to identify the general level of knowledge or use of the menstrual cycle tracking app among medical students at the Faculty of Medicine Sriwijaya University. **Methods.** This type of research is descriptive using a survey. The sample in this study was female medical students at the Faculty of Medicine Sriwijaya University class 2018—2023 who fulfilled the inclusion and exclusion criteria. Sampling was collected by total sampling. **Results.** In this study, 868 respondents participated, it was found that 467 (53.8%) had the highest level of knowledge, namely with “good” category. 685 (78.9%) controlled their menstrual cycles. 450 (65%) used a menstrual cycle tracking application with the most duration of use being  $\geq 1$  year 311 (49.8%). The most widely used application name is Flo My Health & Period Tracker 308 (66.5%). 294 (63.9%) chose the quite satisfied category for the level of satisfaction with using the application. In addition, 396 (86.1%) chose the sufficient category for the level of accuracy in using the application. **Conclusion.** Female medical education students at the Faculty of Medicine, Sriwijaya University have a general level of knowledge with the dominance of the category “good” and a usage rate of 467 (53.8%) in the menstrual cycle monitoring application.

## 1. Introduction

The physical and psychological changes that occur in adolescents mark the process of transition to adulthood. Sexual impulses that lead to an attraction towards the opposite sex are one of the forms of psychological changes that will occur. In terms of physical changes, adolescent girls will experience breast development, widening of the hips, increase in height, and the growth of fine hair around the armpits and vagina. Other changes that adolescent girls will experience during this transition period include the onset of their first menstruation (menarche).<sup>1</sup>

The regular shedding cycle of the uterine lining is known as menstruation. This occurs in response to the actions of hormones from the hypothalamus, pituitary gland, and ovaries. The length of the menstrual cycle is the number of days counted from the first day of menstruation to the first day in the next cycle. Typically, the menstrual cycle lasts for 21—35 days, with an average of 28 days. Irregular menstrual cycles can occur due to variations in the follicular phase length.<sup>2</sup> The impact of irregular

menstrual cycles can increase the risk factors for diseases such as iron deficiency anemia and cardiovascular disease.<sup>3</sup> Over the past 24 years (until the end of 2020), there have been 1,975 cases of premature death in women who experienced irregular menstrual cycles. These early deaths were caused by cancer and cardiovascular issues.<sup>4</sup>

With the advancement of technology and knowledge, individuals can practically track their menstrual cycles using menstrual cycle-tracking applications on gadgets.<sup>5</sup> The first menstrual cycle tracking application was released in 2013. As of June 2020, two applications with the highest downloads were Flo My Health & Period Tracker (2 million downloads) and Clue Period & Cycle Tracker (400 thousand downloads).<sup>6</sup>

The applications not only provide calendar features but also include other features to assist users in observing and analyzing predictions of fertile days, length of menstrual cycles, upcoming menstrual periods, changes in weight, body temperature, mood swings, and more.<sup>7</sup> The abundance of features in the

application adds value, leading many women to choose menstrual cycle tracking applications over other platforms.

In 2018, the World Health Organization (WHO) stated that 80% of adolescent girls worldwide experience irregular menstrual cycles. In the same year, Basic Health Research recorded that 11.7% of adolescent girls in Indonesia experience irregular menstrual cycles. Data collected through surveys resulted in 14.9% of adolescent girls in urban areas experiencing irregular menstrual cycles, particularly in the Special Region of Yogyakarta.<sup>8</sup> This can occur due to several factors, such as high levels of stress and physical activity.<sup>9</sup>

In Indonesia, specifically in Karanghaur Village, Bekasi Regency, West Java Province, it was found that 13 out of 30 adolescent girls were not familiar with menstrual cycle tracking calendar applications. This lack of awareness led to their neglect of menstrual cycle observation.<sup>10</sup> In Gunung Anyar area, Surabaya City, East Java Province, it was recorded that 12 out of 40 adolescent girls had heard of menstrual cycle tracking calendar applications but did not use them because they felt they did not need the application.<sup>11</sup>

Based on the description above, researchers conducted a study to identify the level of knowledge and usage of menstrual cycle tracking applications with a larger population, namely female medical students at the Faculty of Medicine, Sriwijaya University.

## 2. Methods

This study employs a descriptive research design through a survey to determine the level of knowledge and usage of menstrual cycle tracking applications among female medical students at the Faculty of Medicine, Sriwijaya University.

This research was conducted online through a Google Forms questionnaire. The questionnaire was developed using the Guttman scale and its validity and reliability were tested using SPSS Version 22.0.

The population used in this study consists of female medical students at the Faculty of Medicine, Sriwijaya University, from the academic years 2018—2023 (985 individuals). Additionally, the researcher calculated the sample size using the Slovin formula, considering a dropout proportion of 20%. Based on the calculation formula, 356 individuals or respondents were determined as the sample size for this study.

The questionnaire was distributed, completed, and collected through total sampling. The inclusion criteria for this study encompassed all active female medical students of the Faculty of Medicine, Sriwijaya University, who filled out the research Google Forms questionnaire and provided signed informed consent forms. Conversely, the exclusion criteria comprised all female medical students of the Faculty of Medicine, Sriwijaya University Palembang, who did not

complete the research Google Forms questionnaire and signed informed consent forms due to unwillingness, illness, or death.

The data collected within the inclusion criteria will be processed using Microsoft Excel 2019 software. Subsequently, univariate categorical analysis will be conducted to determine the percentage of each obtained data. Data analysis will be performed using SPSS (Statistical Product and Service Solutions) Version 22.0 software. The final results of the data analysis will be presented in the form of graphs and narratives.

## 3. Results

### 3.1. Frequency Distribution of Respondents' Academic Years

Based on the research findings, the distribution of respondents according to the academic years 2018, 2019, 2020, 2021, 2022, and 2023 is depicted in Figure 1.

### 3.2. Frequency Distribution of Respondents' General Knowledge Level Regarding Menstrual Cycle Tracking Applications

The general level of knowledge will be determined by the scores obtained from the questionnaire filled out by the respondents and classified into three categories: good with a score >5, medium with a score of 3—5, and poor with a score <3. Based on the research findings, the frequency distribution of the general level of knowledge regarding menstrual cycle tracking applications can be seen in Figure 2.

### 3.3. Frequency Distribution of Respondents Who Track Menstrual Cycles

Based on the research findings, the frequency distribution of respondents who track their menstrual cycles can be seen in Figure 3.

### 3.4. Frequency Distribution of Media Used in Tracking Menstrual Cycles

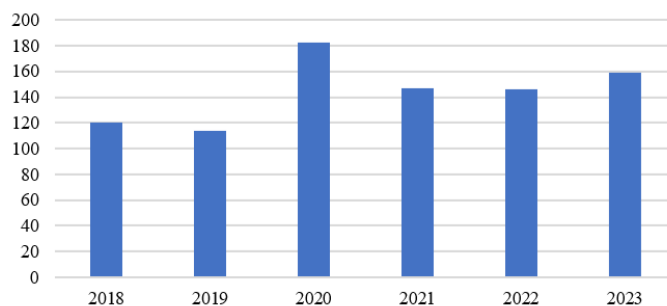
Based on the research findings, the frequency distribution of the media used by respondents to track menstrual cycles is divided into applications, calendars, and others, as shown in Figure 4.

### 3.5. Frequency Distribution of Duration of Usage of Menstrual Cycle Tracking Applications

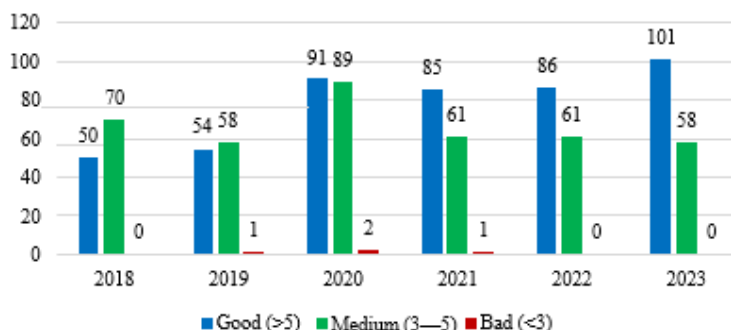
Based on the research findings, the frequency distribution of the duration of application usage among respondents is divided into two categories: <1 year and ≥ 1 year, as shown in Figure 5.

### 3.6. Frequency Distribution of Menstrual Cycle Tracking Application Names Used by Respondents

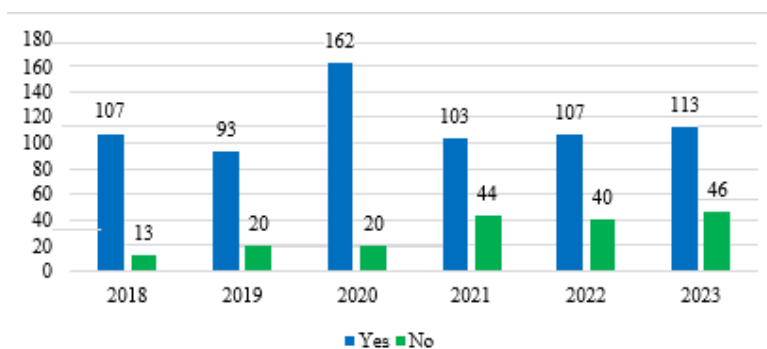
Based on the research findings, the frequency distribution of the names of menstrual cycle tracking applications is divided into six categories: Flo My Health & Period Tracker, Clover Period Tracker Calendar, Clue Period & Cycle Tracker, Femometer Period & Fertility, Period Tracker Period Calendar, and others, as shown in Figure 6.



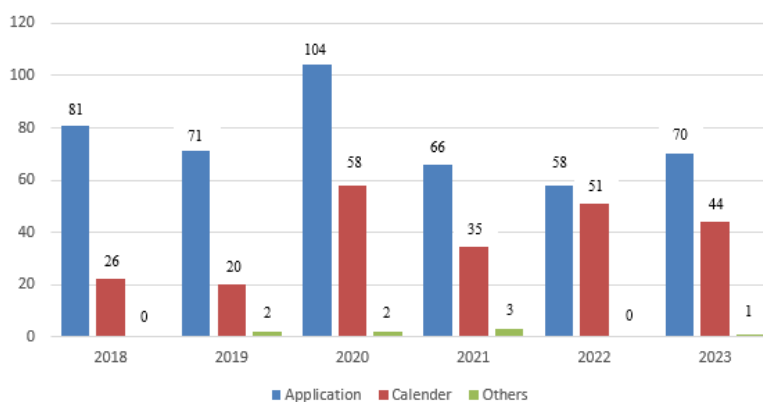
**Figure 1. Frequency distribution of respondents' academic years (n=868)**



**Figure 2. Frequency distribution of respondents' general knowledge level regarding menstrual cycle tracking applications**



**Figure 3. Frequency distribution of respondents who track menstrual cycles (n=868)**



**Figure 4. Frequency distribution of media used in tracking menstrual cycles (n=692)**  
 Note: the value (n) is reduced by respondents who do not track their menstrual cycles.

### 3.7. Frequency Distribution of Respondents' Device Types for Downloading Menstrual Cycle Tracking Applications

Based on the research findings, the frequency distribution of device types is divided into three categories: iOS, Android, and others, as shown in Figure 7.

### 3.8. Frequency Distribution of Respondents' Satisfaction Levels in Using Menstrual Cycle Tracking Applications

Next, the results of the frequency distribution of satisfaction levels in using the application are divided into three categories: very satisfied, satisfied, and dissatisfied, as shown in Figure 8.

### 3.9. Frequency Distribution of Accuracy Levels of Menstrual Cycle Tracking Applications

In the frequency distribution results, the accuracy levels of application usage are divided into three categories: very accurate, moderately accurate, and less accurate, as depicted in Figure 9.

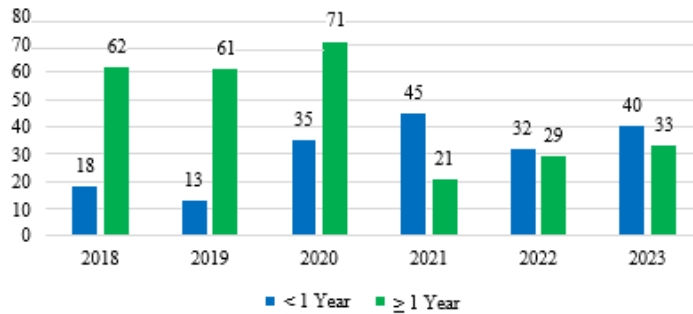


Figure 5. Frequency distribution of duration of usage of menstrual cycle tracking applications (n=460)  
Note: the value (n) is reduced by respondents who did not select an application.

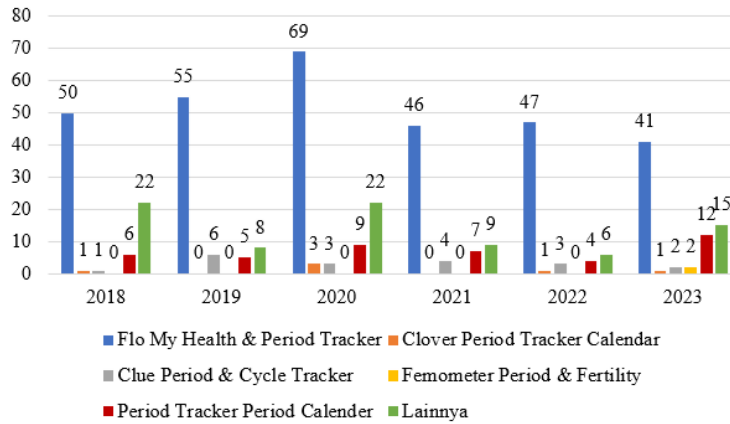


Figure 6. Frequency distribution of names of menstrual cycle tracking applications used by Respondents (n=460)

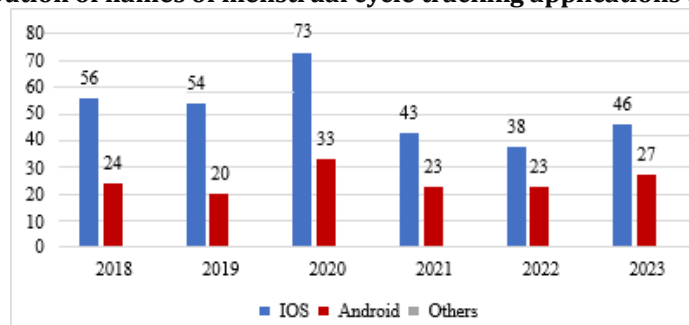
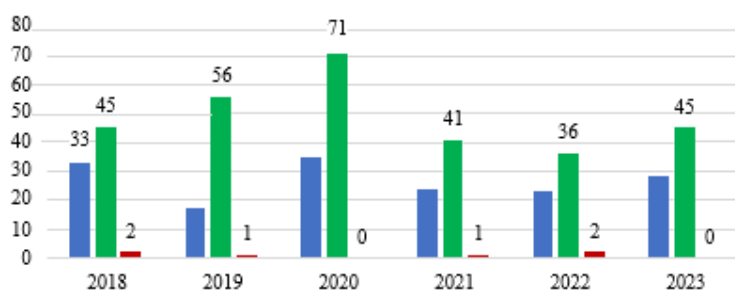
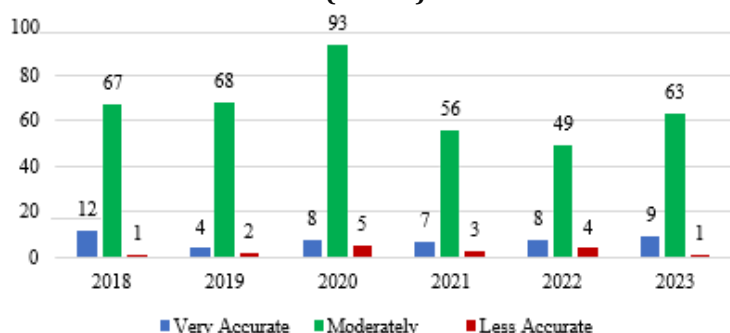


Figure 7. Frequency distribution of device types used by respondents to download menstrual cycle tracking applications (n=460)



**Figure 8. Frequency distribution of respondent's satisfaction levels in using menstrual cycle tracking applications (n=460)**



**Figure 9. Frequency distribution of accuracy levels of menstrual cycle tracking applications (n=460)**

The questionnaire used in this study underwent validity and reliability tests with 30 respondents. The criteria used for the validity test involved setting a significance level of 5%. A validity test at a 5% significance level using 30 respondents is deemed valid if the calculated value (R-value) is greater than or equal to the critical value (Critical value = 0.361).<sup>12</sup>

Based on the analysis conducted, the results of the validity testing can be presented in table 1.

A questionnaire is considered reliable if the Cronbach's Alpha value is greater than 0.60; otherwise, it is considered unreliable.<sup>13</sup> Based on the analysis conducted, the results of the reliability testing can be shown in the following table 2.

**Table 1. Results of questionnaire validity testing**

Variable	Rcount	Rtable	Description
Q1	0.563	0.361	Valid
Q2	0.365	0.361	Valid
Q3	0.170	0.361	Invalid
Q4	0.197	0.361	Invalid
Q5	0.636	0.361	Valid
Q6	0.282	0.361	Invalid
Q7	0.529	0.361	Valid
Q8	0.166	0.361	Invalid
Q9	0.052	0.361	Invalid
Q10	0.207	0.361	Invalid
Q11	0.283	0.361	Invalid
Q12	0.563	0.361	Valid
Q13	0.563	0.361	Valid
Q14	0.075	0.361	Invalid

**Table 2. Results of questionnaire reliability testing**

Number of valid questionnaires	Cronbach's alpha value of the questionnaire	Threshold criteria for Cronbach's alpha value	Description
6	0.654	0.60	Reliable

#### 4. Discussion

In this study, based on the distribution of academic years, there were 120 respondents (13.8%) from the 2018 cohort, 113 respondents (13%) from the 2019 cohort, 182 respondents (13.8%) from the 2020 cohort, 147 respondents (16.9%) from the 2021 cohort, 147 respondents (16.9%) from the 2022 cohort, and 159 respondents (18.3%) from the 2023 cohort.

The respondent's level of knowledge regarding menstrual cycle tracking applications has been measured using a validated and reliable questionnaire. The scores obtained from the knowledge level section of the questionnaire for each respondent have been grouped into three predefined categories. According to the research findings, 467 respondents (53.8%) were categorized as having good knowledge, 397 respondents (45.7%) were categorized as having medium knowledge, and 4 respondents (0.5%) were categorized as having poor knowledge.

Menstrual cycle monitoring is essential as an early detection measure for preventing further health issues. In this study, 685 respondents (78.9%) were found to monitor their menstrual cycles, while 183 respondents (21.1%) did not. Monitoring can be done by recording manually or digitally through calendars.<sup>14</sup> Menstrual cycle tracking applications, commonly known as period tracker apps, are the fourth most popular health apps among adults, with approximately 50 million users, and this number continues to grow each year.<sup>15</sup>

In this study, 450 respondents (65.0%) used applications, 234 respondents (33.8%) used calendars, and 8 respondents (1.2%) used other media to track their menstrual cycles. Based on the research findings, the duration of usage of menstrual cycle tracking applications showed that 311 respondents (49.8%) used the app for more than or equal to 1 year, while 149 respondents (43.0%) used it for less than 1 year.

Currently, the number of menstrual tracking applications has increased. Starting from 2019, there were 49 menstrual tracking applications listed on the Google Play Store and Apple Store.<sup>6</sup> Based on the research findings, respondents selected various menstrual cycle tracking application names, including: Flo My Health & Period Tracker chosen by 308 respondents (66.5%), Clover Period Tracker Calendar chosen by 6 respondents (1.3%), Clue Period & Cycle Tracker chosen by 19 respondents (4.1%), Femometer Period & Fertility chosen by 2 respondents (0.4%), Period Tracker Period Calendar chosen by 43 respondents (9.3%), and others chosen by 82 respondents (17.8%). Other application names used by respondents include PinkBird, Zepp Life, Mi Fitness, Meetyou, and My Calendar. The types of devices used by respondents to download applications are divided into three categories: 310 respondents (67.4%) chose iOS devices, and 150

respondents (32.6%) chose Android devices.

The abundance of features in an application adds value, leading many women to choose menstrual cycle-tracking applications over other platforms.<sup>15</sup> The features within such applications can impact users' health behaviors, such as increasing awareness of why users need to understand their condition during menstruation periods.<sup>16</sup> It was found that 160 respondents (34.8%) expressed very satisfied with using the application as a menstrual cycle monitoring tool, followed by 294 respondents (63.9%) who stated they were satisfied enough, and only 6 respondents (1.3%) who expressed dissatisfaction. In addition to features, accuracy can also influence respondents' satisfaction levels. Based on the research findings, 48 respondents (10.4%) stated the application was very accurate, 396 respondents (86.1%) stated it was accurate enough, and 16 respondents (3.5%) stated it was less accurate.

#### 5. Conclusion

The level of knowledge regarding menstrual cycle tracking applications among female medical students of the Faculty of Medicine, Sriwijaya University, from the academic years 2018—2023 revealed that 467 (53.8%) students possessed good knowledge.

The usage rate of menstrual cycle tracking applications among female medical students of the Faculty of Medicine, Sriwijaya University, from the academic years 2018—2023 is 450 (65%) users.

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I realize that my writing is still far from perfect. Therefore, I welcome all forms of feedback and constructive criticism that can be beneficial and constructive for all of us.

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