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**RESEARCH**

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## Normal Puberty Knowledge and Adolescent Menstrual Cycles

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### Abstract

The degree of understanding of puberty is still very varied. It has an impact on the cleanliness of erroneous menstruation, which will have long-term effects on reproductive health. The study aims to identify adolescent knowledge about normal puberty and menstrual cycles. This research was a quantitative study of observational approach by using the knowledge survey of normal puberty and the menstrual cycle involving 55 students of State Junior High School (SMPN) 1 Parakan, Temanggung, Central Java. The technicality used descriptive statistics. The results of this study revealed that knowledge of the degree of normal paper and the menstrual cycle was still low (21.33%). The main sources of information about puberty and menstruation are thousands (85.5%). Teenagers do not know about the interval between the onset of puberty and menarche (87%), few adolescents understand the first sign of puberty (33%). Most teenagers have understood the normal menstrual cycle correctly (78%). There was no significant relationship between knowledge of the first sign of puberty with respondents' understanding of belief. Meanwhile, there was a significant relationship between menstrual status and knowledge about the menstrual cycle and the number of replacement pads. The results showed that students have a poor understanding of puberty, hence, health education must be given to students and their parents.

**Keywords:** Adolescents, normal puberty, menstrual cycle, knowledge

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## 1. INTRODUCTION

Puberty is a reproductive organ maturation event in adolescents, marked early by the growth of enlarged breast tissue in adolescent girls in the age range of 8-13 years (Osiki et al., 1994 *cit. Reeder, 2015*). Secondary sex growth accompanies puberty, such as breast growth, pubic and axillary hair, dilated hips and pelvis, and menarche, then ovulation occurs the next 6-12 months (Thelus et al., 2009). One of the prominent changes of puberty is menarche. Adolescent responses to puberty vary widely, adolescents can feel happy or vice versa with the changes experienced (Greenspan & Deardorff, 2014).

Social, family and environmental support influences adolescent attitudes and behavior during puberty and menstruation. Cultural and taboo influences that develop in the community strongly influence adolescents, in addition to the level of knowledge about menstruation and its care (Kumar & Srivastava, 2011). Teenagers often experience psychological and social problems during menstruation, such as ridicule from school friends, restrictions on activities in the community, as well as poor access to menstrual sanitation facilities, such as water, soap, sanitary napkins and privacy, especially in poor and developing countries (House et al., 2013). Teenagers lack knowledge about menstruation that should be provided by parents or teachers, so they are not able to do proper hygiene care during menstruation (Chandra-Mouli & Patel, 2017).

From a number of previous studies, no one has done research on the level of understanding of degrees regarding puberty and normal menstrual cycles at school level. Field studies conducted by researchers from January-May 2017 on State Junior High School 1 Parakan students, Temanggung District showed that students' knowledge about puberty and menstruation varies greatly. When they were asked questions, some students are able to answer changes during puberty, the menstrual cycle, but most do not. The results of the interview stated that they felt that they did not have enough information about it. Some students who had menstruated, felt uncomfortable while at school, were afraid of blood staining clothing, and school sanitation facilities were inadequate when they had to change pads and clean themselves. The objective of this study is to assess the level of knowledge about normal puberty and the menstrual cycle in State Junior High School 1 Parakan, Temanggung.

## 2. RESEARCH METHOD

This study is a quantitative, observational study using a survey of normal puberty knowledge and the menstrual cycle of female adolescents in school. The sample of the study was students of State Junior High School 1 Parakan, aged 12-15 years, who were randomly selected in August 2018, invited to become respondents. The research sample consisted of 55 people, out of a population of 120 people. The inclusion criteria for the subjects of this study were 7th, 8th and 9th grade students, obtaining permission from parents and willing to be respondents. The study exclusion criteria were students who were experiencing pain in school, so they were unable to fill out a questionnaire and who refused to become respondents.

Data were collected using a questionnaire from previous research. The research instrument consisted of 15 multiple choice questions. Respondents were asked to choose the answers available, and for some questions, respondents were allowed to choose more than 1 answer.

Data analysis was performed with statistical software, using the Pearson chi-squared test, Fisher's exact test, and Yates continuity correction test to compare additional data for statistical methods (mean, standard deviation, frequency, ratio). P-values <0.01 and <0.05 were statistically significant.

Ethical approval of this study was obtained from the Health Research Ethics Committee of the Faculty of Medicine, Duta Wacana Christian University, Yogyakarta number 726/C.16/FK/2018. Before filling out the questionnaire, the objectives, scope of the study, the rights and obligations of the respondents submitted and informed consent obtained from all respondents. All respondents received permission from their parents to participate in this study.

### 3. RESULTS AND DISCUSSION

Table 1. Respondent Characteristic

|  | Frequency | Percentage (%) |
|--|-----------|----------------|
| <b>Respondents' age (n= 55)</b>                  |           |                |
| 12 years   | 6         | 10,9           |
| 13 years   | 27        | 49,1           |
| 14 years   | 22        | 40,0           |
| <b>Menarche age (n= 49)</b>                      |           |                |
| 10 years   | 1         | 1,8            |
| 11 years   | 6         | 10,9           |
| 12 years   | 30        | 54,5           |
| 13 years   | 11        | 20,0           |
| 14 years   | 1         | 1,8            |
| <b>Menstruation Length (n= 49)</b>               |           |                |
| 3-5 days   | 6         | 10,9           |
| More than 5 days                                 | 43        | 78,2           |
| <b>Regularity of the menstrual cycle (n= 49)</b> |           |                |
| Regular  | 11        | 20,0           |
| Not regular                                      | 38        | 68,1           |
| <b>Mother's occupation (n= 55)</b>               |           |                |
| Housewife  | 30        | 54,5           |
| Employee   | 6         | 10,9           |
| Farmer   | 6         | 10,9           |
| Civil Servant                                    | 1         | 1,8            |
| Private Sector Worker                            | 12        | 21,8           |

Table 1 shows that out of 60 questionnaires distributed, 5 were excluded because they were incomplete, so that the samples in this study were 55 respondents in grades 7, 8 and 9. The average age of respondents was 13.29 + 0.65 years. Out of 55 respondents, 49 students (89.1%) had menarche, at an average age of 12.10 + 0.71 years. The duration of menstruation experienced by 43 people (78.2%) is more than 5 days, with regular cycles of 38 people (69.1%). A total of 30 people (54.5%) of teenagers have mothers as housewives, 12 people (21.8%) are private sector workers, and only 1 person (1.8%) is a Civil Servant. Data on the work of the father, 20 people (36.4%) are private sector workers, 1 person (1.8%) does not work.

Table 2. Knowledge of Puberty and the Menstrual Cycle based on Maternal Knowledge Level

|  | <b>Maternal Education Level</b> |                                     |                                      |                                      |                                   |
|--|---------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|-----------------------------------|
|  | <b>Not graduated<br/>(n=3)</b>  | <b>Elementary School<br/>(n=14)</b> | <b>Junior High School<br/>(n=14)</b> | <b>Senior High School<br/>(n=16)</b> | <b>Higher Education<br/>(n=8)</b> |
|  | <b>n (%)</b>                    | <b>n (%)</b>                        | <b>n (%)</b>                         | <b>n (%)</b>                         | <b>n (%)</b>                      |
| <b>The first symptom of puberty</b>                        |                                 |                                     |                                      |                                      |                                   |
| Breast enlargement   | 0 (0,0)                         | 6 (42,9)                            | 5 (35,7)                             | 5 (31,2)                             | 2 (25)                            |
| The growth of pubic and armpit hair                        | 2 (66,7)                        | 5 (35,7)                            | 3 (21,4)                             | 7 (43,8)                             | 1 (12,5)                          |
| Acne   | 1 (33,3)                        | 3 (21,4)                            | 2 (14,3)                             | 3 (18,8)                             | 2 (25)                            |
| I do not know  | 0 (0,0)                         | 0 (0,0)                             | 4 (28,6)                             | 1 (6,2)                              | 3 (37,5)                          |
| <b>Average time interval of puberty and menarche onset</b> |                                 |                                     |                                      |                                      |                                   |
| Less than 2 years  | 1 (33,3)                        | 4 (28,6)                            | 4 (28,6)                             | 3 (18,8)                             | 2 (25)                            |
| 2-4 years  | 0 (0,0)                         | 1 (7,1)                             | 1 (7,1)                              | 4 (25)                               | 1 (12,5)                          |
| I do not know  | 2 (66,7)                        | 9 (64,3)                            | 9 (64,3)                             | 9 (56,2)                             | 5 (62,5)                          |
| <b>Length of menstrual cycle</b>                           |                                 |                                     |                                      |                                      |                                   |
| Less than 21 days  | 0 (0,0)                         | 1 (7,1)                             | 1 (7,1)                              | 1 (6,2)                              | 0 (0,0)                           |
| 21-45 days   | 2 (66,7)                        | 10 (71,4)                           | 10 (71,4)                            | 14 (87,5)                            | 7 (87,5)                          |
| More than 45 days  | 0 (0,0)                         | 0 (0,0)                             | 1 (7,1)                              | 0 (0,0)                              | 0 (0,0)                           |
| I do not know  | 1 (33,3)                        | 3 (21,4)                            | 2 (14,3)                             | 1 (6,2)                              | 1 (12,5)                          |
| <b>Normal age of first menstruation</b>                    |                                 |                                     |                                      |                                      |                                   |
| 11-13 years  | 3 (100)                         | 13 (92,9)                           | 12 (85,7)                            | 15 (93,8)                            | 8 (100)                           |
| After 13 years   | 0 (0,0)                         | 0 (0,0)                             | 1 (7,1)                              | 0 (0,0)                              | 0 (0,0)                           |
| I do not know  | 0 (0,0)                         | 1 (7,1)                             | 1 (7,1)                              | 1 (6,2)                              | 0 (0,0)                           |
| <b>The average length of menstrual blood flow</b>          |                                 |                                     |                                      |                                      |                                   |
| 2-7 days   | 3 (100)                         | 12 (85,7)                           | 11 (78,6)                            | 11 (68,8)                            | 7 (87,5)                          |
| More than 7 days   | 0 (0,0)                         | 1 (7,1)                             | 2 (14,3)                             | 4 (25)                               | 0 (0,0)                           |
| I do not know  | 0 (0,0)                         | 1 (7,1)                             | 1 (7,1)                              | 1 (6,2)                              | 1 (12,5)                          |
| <b>Replacement of menstrual pads used in a day</b>         |                                 |                                     |                                      |                                      |                                   |
| Less than 3  | 1 (33,3)                        | 3 (21,4)                            | 3 (21,4)                             | 3 (18,8)                             | 1 (12,5)                          |
| 3-6 sanitary pads  | 2 (66,7)                        | 10 (71,4)                           | 9 (64,3)                             | 12 (75)                              | 6 (75)                            |
| I do not know  | 0 (0,0)                         | 1 (7,1)                             | 2 (14,3)                             | 1 (6,2)                              | 1 (12,5)                          |

Table 2 shows that mother's education level, 5.5% (n = 3) did not finish school, 25.5% (n = 14) elementary school, 25.5% (n = 14) Junior High School, 29.1% (n = 16) Senior High School and 14.5% (n = 8) Higher Education. There was no significant relationship between maternal education level and students' understanding of normal puberty development ( $p > 0.05$ ). However, the proportion of female students who have mothers with Senior High School education and above who answer correctly about the menstrual cycle is statistically higher.

Table 3. Sources of Knowledge, Self-Evaluation, Opinion, Knowledge about the Characteristics of Normal Puberty and Menstrual Cycles

| <b>Sources of knowledge, self-evaluation and opinion on puberty</b> |                                     | <b>n</b> | <b>%</b> |
|---|-------------------------------------|----------|----------|
| Source information about puberty                                    | Mother                              | 47       | 85,5     |
|   | Teacher                             | 8        | 14,5     |
| Self-understanding of puberty                                       | Yes                                 | 6        | 10,9     |
|   | Not really                          | 49       | 89,1     |
| Provision of information about puberty                              | Medical service                     | 7        | 12,7     |
|   | Teacher                             | 3        | 5,5      |
|   | Family                              | 36       | 65,5     |
|   | I do not know                       | 9        | 16,4     |
| Optimal conditions talking about puberty                            | There is only female                | 44       | 80       |
|   | There are both male and female      | 4        | 7,3      |
|   | Do not ever do it                   | 5        | 9,1      |
|   | I do not know                       | 2        | 3,6      |
| <b>Knowledge of the characteristics of normal paper</b>             |                                     | <b>n</b> | <b>%</b> |
| The first puberty sign  | Breast enlargement                  | 18       | 32,7     |
|   | The growth of pubic and armpit hair | 18       | 32,7     |
|   | Acne                                | 11       | 20       |
|   | I do not know                       | 8        | 14,5     |
| Average time interval of puberty and menarche onset                 | Less than 2 years                   | 14       | 25,5     |
|   | 2-4 years                           | 7        | 12,7     |
|   | I do not know                       | 34       | 61,8     |
| Length of menstrual cycle   | Less than 21 days                   | 3        | 5,5      |
|   | 21-45 days                          | 43       | 78,2     |
|   | More than 45 days                   | 1        | 1,8      |
|   | I do not know                       | 8        | 14,5     |
| Normal age of first menstruation                                    | 11-13 years                         | 51       | 92,7     |
|   | After 13 years                      | 1        | 1,8      |
|   | I do not know                       | 3        | 5,5      |
| Average duration of menstrual flow                                  | 2-7 days                            | 44       | 80       |
|   | More than 7 days                    | 7        | 12,7     |
|   | I do not know                       | 4        | 7,3      |
| Replacement of menstrual pads used every day                        | Less than 3                         | 11       | 20       |
|   | 3-6 sanitary pads                   | 39       | 70,9     |
|   | I do not know                       | 5        | 9,1      |

| <b>Knowledge of normal characteristics of puberty</b>             | <b>Group 1<br/>(n=6)</b> | <b>Group 2<br/>(n=49)</b> |
|---|--------------------------|---------------------------|
| Breast Enlargement  | 2 (33,3)                 | 16 (32,7)                 |
| The growth of pubic and armpit hair                               | 2 (33,3)                 | 16 (32,7)                 |
| Acne  | 2 (33,3)                 | 9 (18,4)                  |
| I do not know   | 0 (0,0)                  | 8 (16,3)                  |
| <b>Knowledge about menarche and menstrual cycles</b>              | <b>Group 1<br/>(n=6)</b> | <b>Group 2<br/>(n=49)</b> |
| Length of menstrual cycle   |                          |                           |
| 21-45 days  | 4 (66,7)                 | 39 (79,6)                 |
| Normal age of first menstruation                                  |                          |                           |
| 11-13 years   | 6 (100)                  | 45 (91,8)                 |
| Average duration of menstrual flow                                |                          |                           |
| 2-7 days  | 5 (83,3)                 | 39 (79,6)                 |
| Replacement of menstrual pads used every day                      |                          |                           |
| 3-6 sanitary pads   | 6 (100)                  | 33 (67,3)                 |
| Group 1: Students who express understanding about puberty         |                          |                           |
| Group 2: Students who have an inadequate understanding of puberty |                          |                           |

Table 3 shows that of the 55 female students, 89.1% (n = 49) said they did not really understand puberty, while 10.9% (n = 6) understood. As many as 85.5% (n = 47) stated that they obtained puberty information from mothers, and 14.5% (n = 8) from teachers at school. There were no respondents who claimed to get this information from their father or the media (TV and internet).

The correct definitions of normal puberty and the menstrual cycle are: 1) breast enlargement (8-13 years); 2) the time from breast enlargement to menarche is 2-4 years; 3) the average age of menarche is 12-13 years; 4) menstrual cycle is 21-45 days; 5) menstrual period is <7 days; 5) replacement of sanitary pads during menstruation is 3-6 sanitary pads/day.

Respondents assume that the first sign of puberty is breast enlargement and growth of pubic and armpit hair, respectively 32.7% (n = 18), 20% (n = 11) facial acne, and 14.5% (n = 8) stated do not know. A total of 61.8% (n = 34) respondents did not know about the time interval between the onset of puberty until the onset of menarche. 25.5% (n = 14) understood that menarche would occur in less than 2 years after the onset of puberty, 12.7% (n = 7) answered 2-4 years after the sign of puberty appeared. A total of 78.2% (n = 43) correctly understood the menstrual cycle occurred between 21-45 days. Most of the 92.7% (n = 51) stated that the average age of menarche was 11-13 years. As many as 80% (n = 44) of respondents stated that the duration of menstruation was 2-7 days. Respondents who understand correctly that the replacement of menstrual pads 3-6 pads/day is 70.9% (n = 39), but still 20% (n = 11) answered less than 3 times a day.

There is no significant relationship between knowledge of the first sign of puberty between group 1 (which stated understand, n = 6) and group 2 (which stated not really understand, n = 49). Group 1 mentioned the first sign of puberty is breast enlargement, growth of pubic and armpit hair, and acne on the face respectively 33.3% (n = 2). In group 2, 16.3% (n = 8) did not know the first sign of puberty. There was no significant relationship between respondents' understanding of beliefs about the sign of puberty with knowledge of the first sign of puberty (p>0.05).

Knowledge of menarche and normal menstrual cycle patterns in group 1 is better than group 2, knowledge of the normal age of menarche 100% (n = 6) true, the average length of menstrual blood flow 83.3% (n = 5) is correct and replacement menstrual pads used 100% (n = 6) a day. Meanwhile, knowledge about the duration of the menstrual cycle was better in group 2 than in group 1, which is 79.6% (n = 39) true. There is no significant relationship between respondents' understanding of beliefs with knowledge about menarche and normal menstrual cycle patterns ( $p > 0.05$ ).

Based on the status of menarche, in the group of students who had experienced menarche, 87.8% (n = 43) actually expressed did not really understand puberty, and 12.2% (n = 6) understood. In the group of female students who had not had menarche, 100% (n = 6) stated they did not really understand about menarche. There was no significant relationship between menarche status and self-confidence related to understanding puberty ( $p > 0.05$ ). The highest percentage in both groups of students who had or had not experienced menarche stated that people who should provide education about puberty were family (menarche group 67.3% (n = 33); group who do not have menarche 50%, (n = 3). The menarche group said that they did not know who should inform the menarche 14.3% (n = 7), health workers 12.2% (n = 6), then teachers 6.1% (n = 3). 33.3% (n = 2) did not know, and 16.7% (n = 1) stated that health workers had to deliver education about menarche, and none of them chose teachers. There was no significant relationship between menarche status and sources information that should be for teenagers related to puberty and menstruation ( $p > 0.05$ ).

There is the highest percentage of equations regarding optimal conditions discussing puberty in the menarche group and not yet menarche, which is there are only female (81.6% (n = 40) in the menarche group; 66.7% (n = 4) in the non-menarche group. 8.2% (n = 4) in the menarche group stated that discussing puberty is optimal in the condition of men and women, and the same number said never do it, while 2% (n = 1) said they did not know. In the menarche group, 16.7% (n = 1) each said they should never do and did not know. There was no significant relationship between menarche status and the optimal conditions for discussing puberty in the class ( $p > 0.05$ ). In the group of students who have experienced menarche have knowledge that the first sign of puberty is breast enlargement 34.7% (n = 17). The second sign is the growth of hair on the pubic and armpits 32.7% (n = 16), then acne on the face 20,4% (n = 10), and the remaining 12.2% (n = 6) stated they did not know. In the group of female students who had not experienced on menarche stated that the first sign of puberty was the growth of pubic and armpit hairs of 33.3% (n = 2), then enlargement of the breasts and acnes on the face respectively 16.7% (n = 1) and 33, 3% (n = 2) said they did not know. There was no significant relationship between menarche status and adolescent knowledge about the average time interval between the onset of puberty and the case of menarche, with ( $p > 0.05$ ).

Table 4. Evaluation of Puberty Knowledge based on Menarche Status

|   | Menarche<br>(n=49) | No menarche yet<br>(n=6) |
|---|--------------------|--------------------------|
| <b>Self-study of understanding related to puberty (p=0,373)</b> |                    |                          |
| Yes   | 6 (12,2)           | 0 (0)                    |
| Not really  | 43 (87,8)          | 6 (100)                  |
| <b>Who should provide education about puberty (p=0,660)</b>     |                    |                          |
| Medical staffs  | 6 (12,2)           | 1 (16,7)                 |
| Teacher   | 3 (6,1)            | 0 (0)                    |

|  |           |          |
|--|-----------|----------|
| Family   | 33 (67,3) | 3 (50)   |
| I do not know  | 7 (14,3)  | 2 (33,3) |
| <b>Optimal condition on discussing puberty (p=0,130)</b>             |           |          |
| There are only female  | 40 (81,6) | 4 (66,7) |
| There are both female and male                                       | 4 (8,2)   | 0 (0)    |
| Do not ever do it  | 4 (8,2)   | 1 (16,7) |
| I do not know  | 1 (2,0)   | 1 (16,7) |
| <b>First sign of puberty (p=0,217)</b>                               |           |          |
| Breast enlargement   | 17 (34,7) | 1 (16,7) |
| The growth of pubic and armpit hair                                  | 16 (32,7) | 2 (33,3) |
| Acne   | 10 (20,4) | 1 (16,7) |
| I do not know  | 6 (12,2)  | 2 (33,3) |
| <b>Average time interval of puberty and menarche onset (p=0,187)</b> |           |          |
| Less than 2 years  | 14 (28,6) | 0 (0)    |
| 2-4 years  | 6 (12,2)  | 1 (16,7) |
| More than 4 years  | 0 (0,0)   | 0 (0,0)  |
| I do not know  | 29 (59,2) | 5 (83,3) |
| <b>Length of menstrual cycle (p=0,170)</b>                           |           |          |
| Less than 21 days  | 3 (6,1)   | 0 (0,0)  |
| 21-45 days   | 39 (79,6) | 4 (66,7) |
| Less than 45 days  | 1 (2,0)   | 0 (0,0)  |
| I do not know  | 6 (12,2)  | 2 (33,3) |
| <b>Normal age of first menstruation (p=0,263)</b>                    |           |          |
| Before 11 years  | 0 (0,0)   | 0 (0,0)  |
| 11-13 years  | 46 (93,9) | 5 (83,3) |
| After 13 years   | 1 (2,0)   | 0 (0,0)  |
| I do not know  | 2 (4,1)   | 1 (16,7) |
| <b>The average length of menstrual blood flow (p=0,001)</b>          |           |          |
| Less than 2 days   | 0 (0,0)   | 0 (0,0)  |
| 2-7 days   | 41 (83,7) | 3 (50,0) |
| More than 7 days   | 7 (14,3)  | 0 (0,0)  |
| I do not know  | 1 (2,0)   | 3 (50,0) |
| <b>Replacement of menstrual pads used in a day (p=0,232)</b>         |           |          |
| Less than 3  | 9 (18,4)  | 2 (33,3) |
| 3-6 sanitary pads  | 37 (75,5) | 2 (33,3) |
| More than 6  | 0 (0,0)   | 0 (0,0)  |
| I do not know  | 3 (6,1)   | 2 (33,3) |

In table 4, it is explained that the group of female students who had menarche, the largest percentage was 59.2% (n = 29), stated that they did not know the interval between the onset of puberty and menarche, less than 2 years as many as 28.6% (n = 14), meanwhile 2-4 years by 12.2% (n = 6), and no one answered more than 4 years. In the non-menarche group, 83.3% (n = 5) stated that they did not know the time interval between puberty and the occurrence of menarche. There were 16.7% (n = 1) who answered 2-4 years of distance from puberty until the occurrence of menarche. There was no significant relationship between menarche status and adolescent knowledge about the average time of menarche from the initial sign of puberty ( $p > 0.05$ ). In the group of menarche students and have not been menarche did not answer correctly about the menstrual cycle (21-45 days) of 79.6% (n = 39) and 66.7% (n = 4). The group of menarche students 6.1% (n = 3) answered less than 21 days, and 12.2% (n = 6) did not



know. In the group of female students not yet menarche, the percentage stating that they did not know was higher, that is 33.3% ( $n = 2$ ). There was no significant relationship between menarche status and knowledge of menstrual cycle length ( $p > 0.05$ ).

Knowledge about the normal menstrual age of the first menstrual group of menarche students answered 93.9% more correctly ( $n = 46$ ) than the group of not having menarche 83.3% ( $n = 5$ ). The group of female students who had not menarche stated that they did not know 16.7% ( $n = 1$ ) more than the group of students who had menarche 4.1% ( $n = 2$ ). There was no significant relationship between menarche status and normal age of menarche in adolescents ( $p > 0.05$ ). In the group of adolescents who had experienced menarche answered that menstrual duration occurred 2-7 days by 83.7% ( $n = 41$ ), while in the group who had not menstruated 50% ( $n = 3$ ). Meanwhile, the other 50% ( $n = 3$ ) in the group who had not yet received said they did not know. There was a significant relationship between menarche status and adolescent knowledge about the average length of menstrual blood flow, with ( $p < 0.05$ ). In the group of students who had menarche gave the correct answer about replacing menstrual pads in a day (3-6 pads) as much as 75.5% ( $n = 37$ ), less than 3 that is 18.4% ( $n = 9$ ), and did not know 6.1% ( $n = 3$ ). In the group of female students who had not yet had menarche evenly, the response statement was 33.3% ( $n = 2$ ) for the replacement of pads less than 3, 3-6 pads and did not know. There was a significant relationship between menarche status and adolescent knowledge about the frequency of replacing sanitary pads during menstruation ( $p < 0.05$ ).

The average age of students experiencing menarche is 12.1 years, the results of this study is not the same as the research of [Zalni, Harahap & Desfita \(2017\)](#) who found an average age of 11.9 years. This difference in finding is possible due to the influence of nutritional status, fat intake, frequency of junk food consumption and physical activity not examined in this study. However, the age of 12.1 years is still included in the normal age of menarche 10-16 years, with an average of 12.5 years.

The age of menarche has an influence on the attitudes and perceptions of adolescents when experiencing menarche. This attitude can be both positive and negative, so that it will determine adolescents in seeking early help when menarche occurs. The most support systems that adolescents look for when experiencing menarche are mothers and close friends ([Marvan et al., 2007](#)). Teenagers often become afraid and confused about their changes, acne problems; obesity can seriously affect their development ([Klossner & Hatfield, 2010](#)).

In general, respondents' knowledge about normal puberty and the menstrual cycle has not been satisfactory; it is evidenced by whether or not menarche has turned out to have much influence on this knowledge. Maternal educational level does not have much influence on adolescent knowledge about normal puberty and the menstrual cycle. This is in accordance with research by [Isguve, Yoruk, & Cizmechioglu \(2015\)](#) who then suggested that health workers and teachers should be aware of this problem and work together to provide support to students in the school environment.

Different results from research conducted in Ethiopia found that there was a positive relationship between maternal education status and adolescent understanding regarding menstruation. It is because their awareness is high to get information about menstruation ([Upashe et al., 2015](#)). Although there are many sources of information that can be obtained by adolescents about menstruation, mothers are the main source of information. The closeness of mother and child greatly influences this ([Gillooly, 2004 cit. Marvan et al., 2007](#)). Factors that inhibit the ability of mothers to provide menstrual information include shame, lack of knowledge, bad relationships between mothers and

children, mothers feel uncomfortable and incompetent when talking about menstruation (Costos, Ackerman & Paradis, 2002 *cit.* Marvan *et al.*, 2007).

Mother's communication responses related to sexuality (knowledge, comfort, skills, and self-confidence) are the main predictors in the communication process. Mothers with a high response are more likely to have discussions with teenagers related to puberty and reproduction. Parents also need knowledge, comfort, skills and self-confidence to communicate effectively and keep teenagers from avoiding this even though it is often difficult for their children (Miller *et al.*, 2009). Mothers are the main sources of knowledge about menstruation, but cannot be separated from the communication skills of mothers and adolescents. Mothers are the closest people to adolescents and have an interest in protecting their teenage children (Crichton *et al.*, 2012).

Awareness of students of State Junior High School 1 Parakan to get the correct information about menstruation is still not optimal, so they do not work hard to get access to that information. In addition, the taboo and shame culture is one of the obstacles for adolescents to ask questions about puberty and menstruation. In this study, mothers have not become the main source of information about menstruation, although it is the main choice expected by adolescents. Mother's education is not a single influence on adolescent understanding, but especially on mother and child communication (Ratnawati, 2018).

The source of knowledge about puberty, self-evaluation and knowledge opinions about puberty. The results of the study in Ethiopia stated that the main source of information regarding menstruation was the teacher (43.1%). Maternal education status is an independent predictor of menstrual health knowledge (Gultie, Hailu, & Workineh, 2014). In Ghana, menstruation is the second topic discussed after promiscuity, and HIV/AIDS (Manu *et al.*, 2015).

The area where adolescents live also influences the source of information obtained. In urban areas, mothers are the main source of information about menstruation. The mother does not experience obstacles in communicating with her teenage children and is not limited by existing restrictions in the community. In slums, adolescents are embarrassed to talk about menstruation. In this area, the main source of information on menstruation is friends, because they spend a lot of time with friends and feel freer to talk about menstruation with them (Kumar & Srivastava, 2011). Pada penelitian ini, kebanyakan siswi berasal dari lingkungan tempat tinggal di pedesaan, sehingga memberikan pengaruh pada pola komunikasi dan akses sumber informasi. Faktor penghambat lain adalah keterbatasan pengetahuan ibu tentang menstruasi. Ibu sebenarnya paham pentingnya memberikan informasi ini, namun sering ibu membiarkan anak remajanya mengalami menstruasi tanpa diberikan pembekalan spesifik. Ibu mempercayai bahwa anaknya akan mendapatkan informasi dari teman, guru dan akan mengalami secara alamiah peristiwa normal pada wanita yaitu menstruasi. In this study, most students came from rural dwelling environments, thus influencing communication patterns and access to information sources. Another inhibiting factor is the limited knowledge of mothers about menstruation. Mothers actually understand the importance of providing this information, but mothers often let their teenage children experience menstruation without being given specific provisions. The mother believes that her child will get information from friends, teachers and will naturally experience a normal event in women which is menstruation (Ratnawati, 2018).

The results of this study are the same as previous studies in Ghana, Cambodia and Ethiopia, lack of understanding of adolescents due to lack of health information, guidance on menstruation and school facilities. Other factors are about the myths of

menstruation, the relationship between mother and child, and the teacher-student relationship that is less supportive for the discussion of menstruation (Sommer et al., 2015). Education can improve management of menstrual hygiene management and reduce social restrictions. Capacity building through this education is most effectively implemented in schools (Sumpter & Torondel, 2013).

Knowledge of the normal characteristics of puberty and the menstrual cycle. This lack of knowledge is also found in Africa and some other poor countries. Therefore, support is needed from teachers to provide adequate information about menstruation to adolescents, including about hygiene facilities that support hygiene care during menstruation, including sanitation, the use of sanitary pads and a healthy lifestyle. Government policy is also needed to deal with this problem (Sommer & Sahin, 2013).

Research in Pakistan stated that 50% of adolescents experience a lack of knowledge about the origin of menstrual blood and menarche. Many expressed fear when experiencing menarche and 50% did not dare to take a shower during menstruation. It needs serious treatment from health workers to overcome misperceptions and unhealthy behavior (Ali & Rizvi, 2010).

Knowledge of the first sign of puberty is based on self-evaluation of the level of understanding of adolescents. Puberty is a natural thing that will happen to everyone. Information obtained about puberty is very limited and is hindered by the taboo culture to talk about it. The education sector also often avoids it, because this is privacy in the family. This fact has an impact on the quality of sexual education obtained by adolescents, so that few understand about normal puberty (UNESCO, 2014).

Knowledge about menarche and normal menstrual cycle patterns based on the status of menarche. Another research result, which influences knowledge, is the age of menarche, which stated that adolescents have limited knowledge and understanding of menstruation, especially about menarche. Age has a significant influence on adolescent knowledge about menstruation; a more mature age has better knowledge than a young age (Chandra-Mouli & Patel, 2017). In Ethiopia, the average age of menarche is 13.98 years. Fifty-one percent of these adolescents have knowledge about menstruation and care. This treatment is associated with the use of sanitary pads during menstruation. It is supported by the level of maternal knowledge and economic ability of adolescent families (Tegegne & Sisay, 2014).

Referring to research conducted on adolescents related to menarche, illustrated that 27% reported about the physical changes that occur related to menarche, 94% were aware of social and religious restrictions, while 48% were aware of their care and hygiene and 98% had received information about the use of sanitary pads.

Knowledge about menstruation is obtained monthly bleeding that occurs in every woman, is a sign of maturity. Fifteen percent said menstruation was excretion from the stomach, 67% said menstrual blood came from the uterus and 65% from the vagina, while 11% stated menstruation. It indicates that knowledge about menstruation is still lacking (Ramathuba, 2015). This is consistent with the results of research conducted by the author.

Menstruation is taboo, full of myths, misconceptions and traditions that conflict with health. Many teenagers feel uncomfortable when menstruating, due to inadequate facilities, especially in schools with lack of access to clean water, toilets, sanitary pads, soap, that have been contaminated with menstrual blood. In addition, adolescents often experience physical discomfort during menstrual periods. This can reduce his achievement while in school (Ramsden et al., 2013). Research in Tanzania revealed that adolescents who experience puberty do not have adequate guidance on puberty and

menstrual care. Other environments are also less supportive and do not favor gender equality (Sommer, 2010).

Menstrual cycle has been known as one of the vital signs that provide general health information to female adolescent or young adult women. This menstruation reviews about normal puberty, menarche, cycles and blood counts (Hillard, 2014). Young people with less knowledge about menstruation need to do health education. School-based health education provides significant changes to the knowledge, beliefs and actions of menstrual care, complications that can occur if not maintaining hygiene during menstruation and behavior and inhibition of menstruating adolescents in Bangladesh (Haque et al., 2014).

Evaluation of puberty knowledge based on menarche status. Experience gives influence to knowledge about menstruation. It is the same as research conducted in Urmia which stated that there is a significant relationship between knowledge and attitudes, negative feelings, living with people who have experienced menstruation, openness about menstruation and menstrual symptoms. Attitudes about menstruation can be improved by increasing knowledge about teenage menstruation through the mother and teacher (Rabiepour et al., 2017).

In America, adolescents who have experienced menstruation state that puberty will be marked by breast changes. Teenagers will become taller, eat more, have long hair, have better teeth, become thinner and will experience changes in the face to become more mature. Puberty is a term that is not yet familiar in adolescents (Thelus et al., 2009).

Research in Saudi Arabia showed that at the age of 13 years, 43.8% have below average levels of puberty knowledge. Mother is the main source of information for students. It was found 38.9% had a negative attitude towards physical changes during puberty. Lack of information causes negative attitudes and leads to unhealthy behavior among students. Female adolescents need health education about biological changes that occur during puberty, and a healthy lifestyle must be done during menstruation (Alosaimi, 2014).

The results of this study are the same as previous studies in the UK, where only 18.2% expressed understanding of changes in puberty. Different results found that 92.9% of adolescents had knowledge of menarche (Sathe et al., 2017). Another study stated that 66.3% of participants had inaccurate knowledge; only 1/3 of them had proper knowledge of reproductive health in adolescents in Riyadh. Adolescent girls have unsatisfactory knowledge, fulfillment of inadequate hygiene and a positive attitude towards reproductive health. As a recommendation, it is necessary to increase the knowledge of reproductive health and the involvement of parents and teachers to provide adequate education related to reproductive health (Gaferi, Al-Harbi, Yakout, & Soliman, 2018).

Puberty in female adolescent can be measured by physical changes including: pubic hair, armpit hair, breast enlargement. The scale of this change consists of 4 values, which are 1 (none), 2 (rare), 3 (moderate) and 4 (adult). There are also 3 values, namely 1 (none), 2 (rare) and 3 (adult). From this change, parents and adolescents can begin to categorize the physical growth of puberty that has already occurred (Koerselman & Pekkarinen, 2017).

The results of research on knowledge about puberty and different reproductive health found from adolescents who have not menstruated 76.6% correctly stated that the menstrual cycle starts from the first day of menstruation, while 21.4% stated they did not know (Amendezo, 2015).

In a Varanasi study of the assessment of knowledge related to puberty and menstruation among schoolgirls, 64.9% of adolescents who had experienced menarche received information about menstruation from their mothers. Only 45.6% scored more than 50% on knowledge about the age of menarche, the duration of the menstrual cycle, young women experiencing puberty faster than men, the ability to become pregnant after menstruation and childbirth. More than half of teenagers do not understand the origin of menstrual blood. There is misunderstanding regarding the use of sanitary pads, the psychological effects of menstruation and weakness during menstruation (Singh et al., 2006).

#### 4. CONCLUSION

The level of knowledge of State Junior High School 1 Parakan, Temanggung students about normal puberty and the menstrual cycle is still very low. Based on the research results obtained, it is very necessary to have sexual/reproductive health education for young women, especially with the topic of normal puberty and the menstrual cycle. Improving the ability of mothers and teachers to provide information must also be improved by adequate training by health workers or medical staffs.

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