Effectiveness Menstrual Flow Monitoring Education on Menstrual Health Knowledge and Attitude Among University Students

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Article History	Abstrak

Abstrak

Introduction: *Female population 10 to 24 years old occupied almost in 30% of total female population. Female students as one of this subpopulations fall in the late adolescent age and experience a menstrual cycle. It is possible that some of them experience irregular menstrual cycles and have menstrual health issues such as premenstrual syndrome. Lack of early health education in this regard can result difficulty in early detection of menstrual abnormalities and it may develop into a serious reproductive organ disorder that continues into adulthood.* **Objective:** *This study aimed to identify the effect of menstrual flow monitoring (MFM) on the knowledge and attitudes related to menstrual health through lectures, demonstrations, and exercise methods, using the menstrual flow chart (MFC) and the menstrual calendar (MC) during sessions.* **Metode:** *This study design was quasi-experimental with only one group pretest and posttest. The subjects were 117 female students from the Teacher College of Economics Study Program who were selected by purposive sampling method. The data collected were processed using paired t-test. Data analysis revealed significant increase in the mean score of pretest to second posttest on the variables knowledge (p = 0.006) and attitude (p = 0.000).* **Result:** *This study results emphasize the need for further randomized control trial studies aimed at a larger population to disclose more relevant findings.*

Kata Kunci:
Attitude, Knowledge, Late Adolescent, Menstrual Calendar Menstrual Flow Monitoring, Menstrual Flow Chart

INTRODUCTION

Menstruation is one of the signs that indicate that a girl has undergone transition into adolescence, where her sexual and reproductive maturation will occur. Female adolescents often face difficulty in understanding the normal bleeding patterns, and they are reluctant to discuss the topic of menstruation owing to it being perceived as a taboo topic. Menstrual assessment includes determination of the regularity of the menstrual cycle, menstrual cycle duration, and menstrual blood volume, along with the physical and psychological changes that happen during menstruation, such as menstrual disorders (ACOG, 2015).

As per the Population Census in 2020, the population of female 10 to 14 years old was 8.16% among 135 million female populations, approximately 11 million in Indonesia (Badan Pusat Statistik, 2021). Moreover, Badan Pusat Statistik (2021) also released data female population 15 to 19 years old and 20 to 24 years old occupied nearly same amount 11 million and 10 million. These data are significant when perceive female adolescents are future mothers of the next generation. Menstrual disorders can indicate pathological conditions such as endometriosis, endometrial hyperplasia, and ovarian cysts, which can affect the condition of reproductive organs. Therefore, early education about menstruation is important for the present female adolescents or the future mothers.

The prevalence of menstrual disorders among the high school level is still high, that are closely related to menstrual volume and cycle disorders. The US study regarding menstrual irregularities among adolescent farmworker found that irregular menstrual cycle on 38.6 % and 2.3 % had 8-14 days of periods (Carnell et al., 2021). Shita and Purnawati (2014) found that 68.6% of female high school students had menstrual cycle disorders and 32.9 % had volume and duration menstrual disorder. At the college level, study by Milanti, Sulistiawati, Fransiska, and Nugroho (2015) indicated that 65.5% of female students had regular menstrual cycles but 34.5% had irregular menstrual cycles (including 24.6% Oligomenorrhea, 8.2% Polymenorrhea, and 2.1% Amenorrhea).

Menstrual cycles can be presented in the form of a menstrual calendar depicting various data that can be filled by female adolescents every month. Menstrual health education can be contained of menstrual cycles, menstrual monitoring using menstrual flow charts, menstrual pain management, etc. This health education aims to motivate female students to monitor their menstrual health.

The Private University in Banten that had been this study's location has a clinic that is managed by doctors and nurses who provide on-campus health services. Based on the researchers' observation, the campus clinic has not conducted any promotional health services such as health education on reproductive topics, especially menstruation. This lack of initiative is one of the reason that led researchers to research about menstrual health among the female students. The present research intended to increase the level of knowledge on reproductive health among female students in campus

Based on past reports, several irregular menstruation cases and some menstrual-related health problems have gained attention. However, study on the effect of health education about menstruation, especially the use of menstrual flow chart (MFC) as a tool of screening (menstrual health) on campus is very limited. Thus, this current study measured the effect of menstrual flow monitoring on the level of knowledge and student attitudes on menstruation by conducting an experimental study on the campus of Economic Education Study Program Teacher College Faculty in one Private University in Banten.

This study's general purpose is identifying the effect of menstrual flow monitoring on the knowledge and attitudes related to menstrual health on the Teacher College of Education Studies Program in one Private University in Banten. Moreover, the specific purposes of this study are identifying:
- The increase of knowledge level about menstrual health among female students
- The improvement in the attitudes related to menstrual health among the female students
- The effect of menstrual flow monitoring on the knowledge and attitudes related to menstrual health among female students.

Students' attitude toward menstrual health was measured at two time points: before and after providing them with health education. This attitude component was measured using a menstrual health-related attitude questionnaire developed by us after complete validity and reliability testing.

Menstrual flow monitoring is a modification of health education sessions. Health education consisting of menstrual health, demonstrations, and exercises using menstrual flow charts and menstrual calendars. Menstrual health education also covered information regarding techniques for overcoming general menstrual disorders (painful menstruation) with slow deep breathing and warm compresses.

Specified menstrual flow monitoring rarely used in menstrual health in early adult population. Thus, we examine the effect of menstrual health education on menstrual flow monitoring on menstrual knowledge and menstrual attitude.

METHODE

This study utilized a quasi-experimental design, with only one group in the pre-test, post-test 1 and post-test 2. Pre-test was taken precisely before menstrual health education been delivered. Post-test 1 was taken right after menstrual health education. Post-test 2 were taken 40 days after menstrual health education. This study was conducted in the Teacher College Major of Study of Economic Education Program at a private university in Banten between October and November 2017. This study population composed of 143 female students of this college. The number of samples was 106 with using the Slovin formula, included a 10% anticipating of margin of error (Sevilla, 2007). We anticipated the possibility of withdrawn rate and loss to follow up so added 10% of the study population with total 117 students.

We used purposive sampling technique. Inclusion criteria were students who had menarche and never had obtained menstrual flow monitoring priorly. Exclusion criteria were student who is taking prescription which disturbed her fertility period.

Instrument

Demographic questionnaire was used to obtain information on the respondent code, address, age of menarche, first day of last menstruation, history of premenstrual syndrome (PMS), PMS coping, menstrual cycle length, and history of reproductive organ disease. The questionnaire was developed by the researchers themselves.

Menstrual Health Questionnaire consisted of questions on knowledge about menstruation and menstrual health-related attitude. Both questionnaires were developed by researchers based on Bobak (2005) post-testing the validity and reliability. The menstrual health knowledge questionnaire consisted of 12 items, with answer score ranging from 0 to 12. Each correct answer is worth one point, whereas the wrong answer is worth 0. The questionnaire of menstrual health-related attitudes consists of 12 items. The answer scores range from 12 to 48, where strongly agree score is 4, agree score is 3, disagree score is 2, and strongly disagree score is one. In the question numbers 4, 5, 7, 8, and 10–12, the score is reversed.

Menstrual cycle prepares the uterus for pregnancy, and, in the absence of pregnancy, menstruation occurs. One menstrual cycle can reach several variations (the first day of the last menstrual period with the first day of menstruation in the next month). One such cycle may vary with a range of 21–45 days (ACOG, 2015). Menstrual disorders can be grouped into a) menstrual cycle disorders, b) menstrual volume disorders, c) menstrual periods, and d) other menstrual disorders: pre-menopause syndrome and dysmenorrhea.

Knowledge measured in this research is the knowledge of the students of the Teacher College of Economics Study Program of one Private University in Banten with respect to the health of menstruation as measured before and after providing health education. Knowledge subscale developed using menstruation concept.

Menstrual flow chart / MFC in this study developed with slight modification of the menstrual flow chart. The researchers tested the readability of the instrument on the student of Teacher College English Study Program of a private university in Banten together with the validity and reliability tests of the menstrual health knowledge questionnaire and questionnaire of menstrual health-related attitude. MFC developed by adjustment from The Women Health Group Tulsa. Menstrual Calener (MC) is a tool for rapidly calculating the menstrual cycles

Menstrual Calendar (MC) is a tool for rapidly calculating the menstrual cycles. This tool is an indicator of menstrual cycle developed by the researchers. We tested the instrument's reliability on the students of Teacher College English Study Program of one private university in Banten. Both of it prepared with the validity and reliability tests of the menstrual health knowledge questionnaire and menstrual health-related attitude questionnaire.

Validity and Reliability Test

Questionnaires on knowledge, and attitudes related to menstrual health were tested for their validity and reliability (VR). Each question item was considered valid when the value of r was greater than that of r table. The subscales are considered reliable when the value of alpha is >0.6 (Dahlan, 2011). We tested validity and reliability English teaching department 30 female students students in a private university in Banten.

Ethical considerations

Resercheers assured respondents rights throught of three aspect, benefit,a nd confidentiality. This research protocol received ethical review of the Mochtar Riady Institute of Nano technology Ethics Committee with No. 013/MRIN-EC/ECL/IX/2017. The researcher provided explanation about the research objectives, benefits, and procedures to the participants before conducting the study.

RESULT

Respondents Characteristic. Respondents of this study were 117 students who followed the process of research to completion. Table 2 shows the characteristics of the study respondents. Based on Table 1, the average age of respondents was 19.25 years, with the maximum age being 19 years (35.04%). Most of fthe (n=43; 36.75%) respondents belonged to ETP 2015. The mean of menarche in the respondents cysles as well as complaints during menstruation of 3-7 days, with 114 people (97.43%) reporting a normal menstrual cycle length of 21-4 5 days. Mean score of Knowledge adnd Attitude Regarding Menstrual Healt Education. Table 2 shows an increase in the mean value of knowledge variables from pretest to post-tests 1 and 2, but the average knowledge from post-test 2 had decreased. Attitude variables show a continuous increase in the mean values, ranging from pretest post-test 1 and post-test 2.
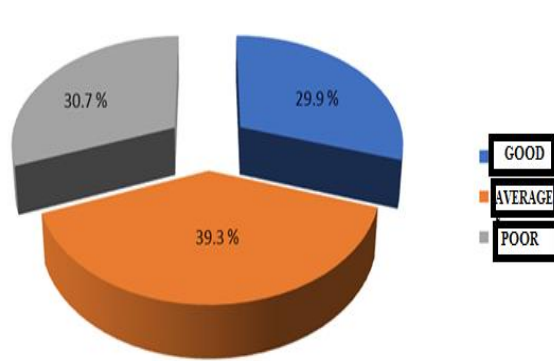
Picture 1 Description of Follow-up Result of Filling Menstrual Flow Monitoring Chart and Menstrual Calen

Table 1
Respondent"s characteristics

Characteristic	N (%)	Mean	SD
Age		19.25	1.21
18	32(27.35)	0	
19	41(35.04)		
20	32(27.35)		

21	7(5.98)		
22	4(3.41)		
Cohort			
ETP 2014	5(4.27)		
ETP 2015	43(36.75)		
ETP 2016	36(30.76)		
ETP 2017	33(28.20)		
Menarche age		12.8	1.341
10	4(3.41)		
11	9(7.69)		
12	43(36.75)		
13	29(24.78)		
14	18(15.38)		
15	12(10.25)		
17	2(1.71)		
Regular Menstruation Cycle			
Yes	84(71.8)		
No	33(28.2)		
Menstrual Problem			
Yes	75(64.1)		
No	42(35.9)		
Menstrual duration			
Normal (3–7 days)	111(94.9)	5.48	1.715
Lengthen (>7 days)	6(5.1)		
Length of menstrual duration		28.69	5.983
Short (<21 days)	2(1.7)		
Normal (21–45 days)	114(97.43)		
Lengthen (>45hari)	1(0.8)		
Total	**117 (100)**		

Table 2

Description for knowledge and attitude regarding menstruation score

Variable	Time	N	Minimum	Maximum	Mean	SD
Knowledge	Pretest	117	17	83	55.98	11.929
	Posttest 1	117	42	100	85.26	13.374
	Posttest 2	117	42	100	80.56	14.558
Attitude	Pretest	117	28	41	34.50	2.812
	Posttest 1	117	27	46	35.74	3.835
	Posttest 2	117	28	48	36.82	4.774

The value of respondents at the pretest, post-test 1, and post-test 2 are given in Table 3.

Researchers assessed the post-test 2 results (40 days after the intervention) on the menstrual calendar and menstrual flow monitoring chart collected from all respondents. Respondents were assigned in the good category if they presented with complete menstrual calendar and menstrual flow monitoring chart (date of start of menstruation, year, and complaint during menstruation filled with information) and showed accuracy between description on menstrual calendar with menstrual flow monitoring chart. Respondents were assigned to the moderate category if there was incompleteness on both the sheets (menstrual calendar and menstrual flow monitoring chart). Respondents were assigned to the bad category when the two sheets were incomplete and inappropriately filled.

Paired t-Test Result of Knowledge and Attitude regarding Menstrual Health

Researchers used paired *t*-test to identify the effect of menstrual flow monitoring intervention on the knowledge, awareness, and attitudes related to menstruation at pretest (before intervention), post-test The 1 (immediately after intervention), and post-test 2 (at 40 days after the intervention). The statistical results are given in Table 4.

Based on Table 2, $p < 0.05$ was obtained for almost all variables, which indicate a significant difference in the mean score of knowledge and attitudes in relation to menstruation before and after educational intervention. This finding indicates that the menstrual flow monitoring education intervention had a significant influence in increasing the mean score of the three variables tested.

Table 3
Paired t test result for knowledge and attitude toward menstruation

Time	Mean(SD)	Mean	p-Value	CI 95%
Knowledge about menstruation				
Pretest - posttest 1	55.98 (11.929) 85.26 (13.374)	29,28	0,001	32,118–6,429
Posttest 1- *posttest* 2	85.26 (13.374) 80.56 (14.558)	-4,7	0,001	28,059- 21,086
Pretest-posttest 2	55.98 (11.929) 80.56 (14.558)	24,58	0,006	1,346–8,056
Attitude toward menstruation				
Pretest- posttest 1	34.50 (2.812) 35.74 (3.835)	1,248	0,0001	1,875–0,621
Postest 1 – posttest 2	35.74 (3.835) 36.82 (4.774)	1,077	0,047	3,319–1,331
Pretest – posttest 2	34.50 (2.812) 36.82 (4.774)	2,325	0,0001	2,140–0,014

Attitude toward menstruation

This study aimed to evaluate the influence of health education related to menstruation on the attitudes of respondents in a situation or event of menstruation before and after imparting the education. Cognitive responses and affective responses through statements were selected by respondents through pretest and post-test questionnaires. Behavioral responses that could be assessed in this study are the willingness and awareness of respondents in filling menstrual flow monitoring on follow-up in post-test 2.

This study showed an increase in the mean score on the components of the attitude that signify pretest to post-test 2 (on day 40 of intervention). The cognitive response to increased educational interventions on menstruation in the variables of knowledge and affection responses on the awareness variable also increased. The increase of these two variables was also followed by an increase in the mean score of the variable attitude in this research.

This study provides menstrual-related education with a focus on menstrual flow monitoring and menstrual calendar in the teaching sessions along with the practice of filling out the menstrual monitoring sheets. The responses of the respondent's attitude toward education could be analyzed by collecting all menstrual flow monitoring chart and menstrual calendar. All respondents filled the menstrual cycle of respondents during the intervention period until the follow-up on post-test 2 (on day 40 after intervention).

The results of category (correct and complete filling) of menstrual flow monitoring chart and menstrual calendar in this study was 29.9% good, 39.3% moderate, and 30.7% bad. Incorrect and

incomplete filling categories were still high at 30.7%. The analysis that can be stated is the time for education, with only one meeting and limited exercise period as a factor of respondent that could not be filled correctly and completely. All respondents filled in and returned the two sheets at the time of follow-up showing attitudes toward the health education stimulus about menstruation and menstrual flow monitoring that began to form at the follow-up post-test 2.

DISCUSSION

Knowledge about menstruation

Menstruation-related knowledge in this study included knowledge about female reproductive cycle, puberty, and understanding of the menstrual cycle. Knowledge of menstruation in students of early age before intervention was 55.98 (mean score). This pretest value increased in the post-test 1 session to 85.26. Most studies provide data that the mean pretest score (before intervention) was indeed low and increased post-intervention. Our results are in concordance with those of Anitha and Karuppiah (2015), who reported that the mean knowledge scores before planned teaching programs/planned learning programs about menstruation were 5.27 (SD 1.87), which improved to 8.22 (SD 1.18) post-intervention. Knowledge among the students increased when interventional education steps were taken in the form of lectures by the researchers as well as through planned or conceptual teaching programs.

Menstrual flow monitoring interventions have a significant influence in increasing the mean of knowledge variables (p = 0.00) between pretest and post-test 1, with a p = 0.006 between pretest and post-test 2. These results suggest that health education with lecture methods is sufficient to improve knowledge in relation to menstrual health among the early adult female population. Research by Hague, Rahman, Itsuko, et al. (2014) in Bangladesh on the experimental topic "Effects of school-based educational interventions on menstrual health in adolescent girls" also improved in terms of knowledge variables with p < 0.001. The method of education utilized in the present study was only a lecture method, with one-time face-to-face interaction, whereas that in the past Bangladesh study was through provision of an education package for 45 min every 2 weeks. However, there was a significant effect on the variable of knowledge related to menstrual health in our study.

Educational intervention in the research by Anitha and Karuppiah (2015) also had a significant effect on the intervention group, with p = 0.000. The study recommends that a planned instructional program related to menstruation should be performed on teachers at schools to continue regular periodic hygiene teaching about menstruation. In this study on a population of students with teacher departments, the researchers observed that it was difficult to hold teaching or health educational programs on menstruation on a regular basis. At the high school or junior high school level, there is a lot of cooperation with institutions such as health centers for the empowerment of health activities, such as school clinic ; however, at the university level, such cooperation is rare. Although the resulting increase in the mean score obtained in this study was significant in pretest 1 to post-test 1 or in pretest to post-test 2, the follow-up process performed on post-test 2 was limited to short meetings alone without education. The mean score on the pretest can still be classified as low enough, which indicates that the age group of early adult women needs health education in relation to menstruation as a source of information for improvement of their knowledge.

Attitude toward menstruation

This study revealed an increase in the mean score on different attitude components as compared with the perception of menstruation scores reported by Moon et al. (2021) reported increasing in menstrual knowledge and menstrual perception using multi-experimental menstrual education. Analyses revealed that perception toward menstruation of respondents have been influenced by the contents of menstrual education using hands on menstrual product, product demonstration on perineal mannequin, and Youtube video (Moon et al., 2021). Moon's study focused on menstruation process and menstrual products with variable knowledge and perceptions that been studied. Moon's study showed improvement on respondents' menstruation knowledge and perception after interventions. This current

study focused on menstrual health, especially that the importance of understanding menstrual flow monitoring has a significant effect on improving the mean score of attitude

CONCLUSION

This currents study indicates the significant effect of menstrual flow monitoring on the knowledge, and attitudes in relation to menstruation among the students of Teacher College of Economics Study Program of a private university in Banten. The follow-up results of post-treatment health education indicate that a subset of the student subjects (39.3%) filled the menstrual calendar and menstrual flow chart sufficiently. This educational activity improved the knowledge and attitude of female students as they made an effort to record their menstrual cycle on the menstrual flow chart provided during post-test to II. Therefore, we suggest that providing adolescents with the right tool or media to record their menstrual cycle can help detect abnormal menstrual cycles in a timely manner. In addition, the researchers also suggested that menstrual health education methods can be divided into 2–3 sessions, with interesting variations in the experimental approaches, such as the involvement of group discussions or the use of mobile applications to record the menstrual cycle. The researchers plan to scale up the present research by including a greater sample size and improved research designs such as randomized control trial to obtain representative findings that can be applied for future interventional strategies.

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