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The Application of William Flexion Exercise to Reduce Pain Levels for Teenage Girls with Dismenorea

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ABSTRACT
Dysmenorrhea is a common problem experienced by adolescent girls and can interfere with daily activities, concentration, and school attendance. One safe non-pharmacological intervention used to reduce menstrual pain is William Flexion Exercise, which helps relax muscles and improve blood circulation. This study used a descriptive design with a case study approach involving two adolescent girls aged 16 years who experienced dysmenorrhea on the first day of menstruation. Data were collected using a pain checklist instrument with the Numerical Pain Rating Scale (NPRS). The intervention was conducted for three consecutive days through William Flexion Exercise for 10–15 minutes with six movement techniques. Before the intervention, Subject I experienced pain at scale 5 and Subject II at scale 6, both categorized as moderate pain. Both subjects complained of pain in the lower abdomen radiating to the waist, accompanied by discomfort during activities. After three days of intervention, Subject I's pain decreased from scale 5 to 2, while Subject II's pain decreased from scale 6 to 3, indicating a reduction from moderate to mild pain. The decrease in pain intensity occurred because William Flexion Exercise strengthens the abdominal and lower lumbar muscles, improves blood circulation, and increases oxygen supply to reproductive organs, thereby reducing uterine muscle contractions caused by prostaglandin activity. Differences in pain perception between subjects were influenced by individual pain experiences and responses. Hormonal factors, stress, and unhealthy lifestyle habits such as frequent fast-food consumption were identified as contributing factors to dysmenorrhea in both subjects. William Flexion Exercise was effective in reducing dysmenorrhea pain levels among adolescent girls and can be recommended as a safe non-pharmacological intervention for menstrual pain management.

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1. INTRODUCTION

Adolescence is a transitional period from childhood to adulthood. Young girls (students) experience physical, emotional, and psychological changes. Furthermore, they experience their first period (menarche), which is followed by a periodic discharge of blood from the uterus, known as menstruation [1]. Menstruation in young girls is not always normal; several disorders can occur during menstruation, one of which is menstrual pain (dysmenorrhea). Dysmenorrhea is pain experienced by women during menstruation and is usually accompanied by dizziness, nausea, and even fainting. Dysmenorrhea is caused by contractions of the uterine wall, which compress the blood vessels and surrounding area, reducing the supply of oxygen and nutrients to the uterus, which can trigger pain.

Dysmenorrhea itself can be divided into two types: primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is menstrual pain that typically begins in adolescents 6-24 months after menarche (first period). Primary dysmenorrhea typically improves over time. Meanwhile, secondary dysmenorrhea is caused by certain diseases (pathological) [2]. Primary dysmenorrhea is caused by an increase in the hormone prostaglandin, which stimulates muscle contractions in the uterine wall. This increase in prostaglandin can cause pain in the lower abdomen and back. Other causes include stress and an unhealthy lifestyle. Stress itself can increase cortisol levels, which can affect the ovulation phase, leading to increased prostaglandin levels [3].

Unhealthy lifestyle choices include excessive consumption of fast food. Fast food contains free radicals that can damage cell membranes, including phospholipids, leading to increased prostaglandin levels [4]. Secondary

dysmenorrhea can be caused by diseases such as endometriosis, pelvic inflammatory disease, fibroids, cysts, and tumors [2]. WHO data shows that 1,769,425 women (90%) experience severe dysmenorrhea, with another 10% experiencing mild dysmenorrhea. In Indonesia, there are 107,673 women (64.25%), consisting of 59,671 (54.89%) with primary dysmenorrhea and 9,496 (9.36%) with secondary dysmenorrhea (Baiti et al., 2021). Data from the South Sumatra Health Office indicates that the incidence of dysmenorrhea in 2020 was 64.3% [5].

Based on a preliminary randomized study using questionnaires at MAN 1 Lubuklinggau City, which is part of the Megang Community Health Center (Puskesmas) working area, Lubuklinggau City, the study found that 107,673 women (64.25%) experienced severe dysmenorrhea. Of the 138 female students who completed the questionnaire, 116 (84.1%) experienced menstrual pain, while 22 (15.9%) did not experience menstrual pain. After collecting data on the pain scale experienced by students at MAN 1 Kota Lubuklinggau, it was found that 59 (42.8%) experienced moderate pain, 44 (31.9%) experienced mild pain, 22 (15.9%) experienced no pain at all, 7 (5.1%) experienced severe pain, and 6 (4.3%) experienced unbearable pain. Of the 138 students who completed the questionnaire, 64 reported that the pain interfered with their daily activities. However, female students don't have a full school holiday due to their responsibilities of studying and completing attendance records. They sometimes rest in the health center to reduce pain. Based on data obtained from questionnaires, the majority of female students were unaware that menstrual pain can be reduced with exercise or stretching; they simply rested, slept until the pain subsided, and drank or applied warm compresses to reduce the pain.

Dysmenorrhea can have negative impacts on adolescent girls. Teenage girls who experience menstrual pain will experience disruptions in their daily activities and lower academic performance compared to those who do not experience menstrual pain. According to Suwanti et al. (2020), menstrual pain can lead to absences from work and school. As many as 13-51% of women have been absent at least once, and 5-14% are repeatedly absent due to menstrual pain [6]. Menstrual pain management can be done pharmacologically and non-pharmacologically. Pharmacologically, menstrual pain can be reduced by taking painkillers such as paracetamol, ibuprofen, and mefenamic acid. However, excessive use of these medications can lead to drug dependence and other adverse effects on the body, such as ulcers, kidney dysfunction, liver damage, and hypertension [7].

Therefore, a safe step to reduce menstrual pain (dysmenorrhea) is to use non-pharmacological therapies such as exercise or training, which are relaxation techniques that can be used to reduce menstrual pain (dysmenorrhea). One type of exercise or training that can be done to reduce menstrual pain is the William Flexion Exercise. The William Flexion Exercise technique can help reduce menstrual pain by suppressing the production of the hormone prostaglandin and reducing blood vessel constriction, thus improving blood flow, which leads to fewer uterine contractions[7].

The William Flexion Exercise is an exercise program that aims to stretch the posterior muscles and increase the strength of the abdominal and lower lumbar muscles. Muscle contractions in the abdominal and lower lumbar regions put pressure on the large abdominal blood vessels, which in turn increases blood flow throughout the body, including the reproductive organs. This can then facilitate oxygen supply to the affected blood vessels, thereby reducing pain [8]. The William Flexion Exercise is an exercise for people with lower back pain developed by Dr. Paul William in 1937, using a method of strengthening the abdominal muscles and gluteus maximus and stretching the back extensor muscles. The movement involved is lumbosacral flexion, and the exercise should be performed daily but not exceeding the pain threshold [9].

Based on research conducted by Wulandari et al. (2024), it was found that before being given the William Flexion Exercise three times during menstruation, nine of the 20 female students studied experienced severe menstrual pain and 11 experienced moderate pain [7]. After the William Flexion Exercise, nine of the 20 female students experienced moderate pain and 11 experienced no pain. Therefore, it was concluded that the William Flexion Exercise can reduce the intensity of dysmenorrhea pain.

Another study conducted by Anggreni et al. (2022) found that before performing the William Flexion Exercise technique, 13 of 16 female students experienced moderate menstrual pain, and 3 experienced mild menstrual pain [8]. After performing the William Flexion Exercise technique, 15 of the 16 female students who were the subjects of the study experienced mild menstrual pain, and 1 female student experienced moderate menstrual pain. Therefore, it was concluded that the William Flexion Exercise technique can reduce the intensity of menstrual pain (dysmenorrhea).

2. RESEARCH METHOD

This study employed a descriptive method. The subjects consisted of two adolescents who met specific eligibility criteria. The inclusion criteria were as follows: the client was willing to participate in the study, aged between 15 and 20 years, experienced moderate menstrual pain with a pain scale of 4–6, had pain lasting more than one day, and engaged in physical exercise one to two times per week. The exclusion criteria included clients who had other medical conditions such as gastroesophageal reflux disease (GERD) or diarrhea, as well as clients who were undergoing medical treatment or taking analgesic medications during the study period.

The study was conducted from March to May 2025 in the working area of Megang Community Health Center, Lubuklinggau City. The population consisted of adolescents studying at MAN 1 Lubuklinggau City who resided within the Megang Community Health Center service area. The sampling technique used in this study was random sampling, ensuring that each member of the population had an equal opportunity to be selected as a research participant according to the established criteria.

The data collection instruments used in this case study proposal included a menstrual pain questionnaire as a data collection format for respondents experiencing dysmenorrhea, a family nursing care format based on established standards, a pain assessment standard operating procedure (SOP), a William Flexion Exercise standard operating procedure (SOP), and an evaluation format to assess the outcomes of the William Flexion Exercise implementation. Pain scale measurements were conducted before and after the William Flexion Exercise intervention. These measurements were performed for three consecutive days during the menstrual period.

The data collection method involved gathering all relevant data from the population. Respondents experiencing moderate pain were then randomly selected based on the inclusion and exclusion criteria determined by the researcher. The research process continued with the assessment phase, which included home visits, direct observations, and interviews with families or family members experiencing dysmenorrhea who met the study criteria.

Data processing was carried out by analyzing all available data obtained from multiple sources, including questionnaires, interviews, and direct observations. Furthermore, evaluations based on the standard operating procedures (SOPs) were used to document patient progress throughout the implementation of the William Flexion Exercise intervention. This study received ethical approval with research ethics number No. 0208/KEPK/Adm2/III/2025

3. RESULTS AND DISCUSSION

In accordance with the nursing process, this research begins with assessment, diagnosis, intervention, implementation, and evaluation. The subjects of this study were two adolescent girls experiencing dysmenorrhea who were selected according to the inclusion criteria previously determined by the researcher.

Subject I, with the initials Ms. J, aged 16, complained of pain in the lower abdomen (suprapubic area). She stated that it was the first day of her period. The pain felt like stabbing pain and spread from the lower abdomen (suprapubic area) to the waist, making her uncomfortable during activities. The pain she experienced was categorized as moderate (5 on the scale). The subject stated that when the pain began, it lasted approximately 15 minutes. The subject reported that her menstrual blood appeared brown and was light. The subject reported that she experienced her first period (menarche) at age 13. The subject stated that she was not yet aware of non-pharmacological methods to reduce the pain of dysmenorrhea. BP: 100/80 mmHg, RR: 21 beats/minute, Pulse: 87 beats/minute, Temp: 36.6 °C, CRT ≤ 2 seconds, consciousness: Composmentis, condition: appears weak. The assessment was conducted on April 19, 2025.

Subject II, with the initials Ms. C, is 16 years old. The subject complained of pain in the lower abdomen (suprapubic area). The subject stated that it was the first day of her period. The pain felt like being squeezed, and spread from the lower abdomen (suprapubic area) to the waist. The pain felt by the subject was categorized as moderate pain on a scale of 6. The subject stated that when the pain occurred, the pain was felt for 20-30 minutes. The subject stated that the menstrual blood appeared brownish, slightly clotted, and came out in small amounts. The patient complained of pain every month. The subject stated that she experienced her first period (menarche) at the age of 14. The subject stated she was not familiar with non-pharmacological methods for managing dysmenorrheal pain. BP: 100/70 mmHg, RR: 20 beats/minute, Pulse: 77 beats/minute, Temp: 36.6°C, CRT ≤ 2 seconds, consciousness: Composmentis, condition: Appears weak. The assessment was conducted on April 26, 2025.

3.1 Nursing Diagnosis

The nursing diagnoses identified in subjects I and II, based on the assessment results, were:

1. Pain related to the family's inability to care for the sick family member.
2. Knowledge deficit regarding non-pharmacological management to reduce pain related to the family's inability to recognize health problems.

3.2 Nursing Intervention

The nursing interventions performed on subjects I and II for acute pain included non-pharmacological pain management using the William Flexion Exercise. The established objectives are expected to be achieved through the implementation of interventions to improve patient health.

3.3 Nursing Implementation

At this stage, the researcher implemented the previously developed intervention by implementing the William Flexion Exercise, which consists of six movements: pelvic tilt, single knee to chest, double knee to chest,

partial sit-up, hamstring stretch, and hip flexor stretch. These movements were performed for three consecutive days during menstruation. Pain scale measurements were taken before and after the procedure.

3.4 Nursing Evaluation

Pain scale measurements were taken before and after each William Flexion Exercise application using a Numeric Rating Scale. The results of applying the William Flexion Exercise for 3 days to reduce menstrual pain levels in two menstruating subjects were as follows:

Table 1. Reduction in Pain Scale for Subject I (Ms. J)

Day/Date	Scale Before	Scale After
Saturday, April 19, 2025	5	5
Sunday, April 20, 2025	4	3
Monday, April 21, 2025	3	2

Table 2. Reduction in Pain Scale for Subject II (Ms. C)

Day/Date	Scale Before	Scale After
Saturday, April 26, 2025	6	6
Sunday, April 27, 2025	4	3
Monday, April 28, 2025	4	3

Tables 1 and 2 show a reduction in pain scale after applying the William Flexion Exercise for 3 consecutive days during menstruation. In subject I, the pain scale decreased from 5 (moderate) to 2 (mild). In subject II, the pain scale decreased from 6 (moderate) to 3 (mild).

The research results showed a decrease in pain after applying the William Flexion Exercise for three days. The William Flexion Exercise is a non-pharmacological method for reducing menstrual pain. The William Flexion Exercise aims to strengthen the abdominal muscles and mobilize the lower lumbar region. Contractions of the abdominal and lower lumbar muscles put pressure on the large blood vessels in the abdomen, which in turn increases blood volume throughout the body, including the reproductive organs. This can improve oxygen supply to vasoconstricted blood vessels, thereby reducing menstrual pain [10].

Subject I and Subject II were both 16 years old and complained of menstrual pain on the first day of their period. The pain was felt by both subjects in the lower abdomen (suprapubic region) and radiated to the waist. The complaints experienced by both subjects were dysmenorrhea; these signs and symptoms align with the definition of dysmenorrhea according to the theory in the book "Maternity Nursing," which states that dysmenorrhea is pain complained of by women during menstruation, characterized by constant, spasmodic discomfort in the lower abdomen that radiates from the back to the thighs [11].

Subject I described the pain as feeling like stabbing, while Subject II described it as feeling like squeezing. This difference in pain description aligns with the theory that differences in pain perception can occur due to differences in how pain is interpreted based on individual experiences [12]. Subject I and Subject II reported that menstrual pain is typically felt on the first and second days. This aligns with the theory from the journal that increased prostaglandin levels occur during the first two days of menstruation, which can trigger contractions in the uterine wall muscles, thus causing pain [9]. Subject I experienced a pain scale of 5 (moderate pain), while Subject II experienced a pain scale of 6 (moderate pain). This difference in pain scale aligns with a journal article stating that pain scale differences depend on a person's perception or experience of pain [13].

Subject I experienced menarche (first menstruation) at age 13. She reported no pain during her first period, but began to experience pain the following month. Subject II experienced menarche (first menstruation) at age 14. She reported no pain during her first period, but began to experience pain the following month. In research conducted by Silvana, menarche occurred between the ages of 9 and 15. If menarche occurs at an earlier age than normal, when the reproductive organs are not yet ready to undergo changes and the cervix is still narrowing, pain during menstruation will occur [14].

Both subjects were assessed on the first day of their periods. The first subject reported that the menstrual blood she experienced was light and brownish in color. This aligns with the theory of Manuaba (2009), which states that increased menstrual blood flow and peak pain often occur when bleeding is still light [15]. The second subject reported that the menstrual blood she experienced was brownish and slightly clotted. This aligns with the theory in the book "Maternity Nursing Care," which states that menstrual blood discharge consists of fragments of shed endometrium mixed with blood. Blood is usually fluid, but if the blood flow rate is too high, clots of various sizes are likely to be found. These menstrual blood clots are caused by an active local fibrinolytic system in the endometrium [16].

Both subjects reported regular menstrual cycles, with periods lasting 7-8 days. These assessment results align with the theory in the book "Maternity Nursing (Theory and Application)," which states that the duration of menstrual bleeding varies. Each menstrual period generally lasts around 3-6 days. However, some women

menstruate for only 1 to 2 days, and others for 7 days. This is still considered normal if this is the case every time. Several studies have shown that dysmenorrhea is most common in adolescents with periods lasting 3 to 7 days, accounting for 69.7% [11]. The cause of dysmenorrhea experienced by both subjects was hormonal factors, namely increased prostaglandin levels caused by stress and unhealthy lifestyle habits, such as frequent consumption of fast food.

4. CONCLUSION

The results of the application of the William Flexion Exercise show that the application of the William Flexion Exercise can reduce the level of pain in adolescent girls who experience dysmenorrhea.

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