

Handling of Premenstrual Syndrome (PMS) among Adolescent Girls: A Systematic Literature Review

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Abstract — Premenstrual Syndrome is one of the most common disorders among women which include a group of physical and psychological symptoms. Symptoms occur during the luteal phase of the menstrual period and stop when menstruation begins. PMS has a higher prevalence in Asian countries compared to western countries. PMS prevalence rate in Indonesia reaches 85% of the female population of reproductive age. The impact of PMS is an increasing amount of work absenteeism, large medical expenses, and low health quality because it disrupts the activities of women. Midwives are responsible for midwifery care throughout a woman's life cycle so that midwives can prevent and treat PMS. This encourages the authors to explore and decipher PMS treatment among adolescent girls. The aim of this study is to conclude and check literature (examine literature) associated with the handling of PMS among young women through Evidence Based Practice. This study implemented Systematic Literature Review. A database of PubMed, Proquest and Ebsco with a period of years from 2009 to 2018 was used. The results of this research show that through early identification of 279 articles, this study analyzes six articles that meet the inclusion criteria. PMS Treatment includes supplementation of calcium, COC, a combination of calcium plus vitamin D, a combination of calcium plus vitamin B6 and the combination of CBT and calcium plus vitamin D. The administration of COC side effects of CBT exercise takes a long duration of the study. Therefore, the results are not statistically significant. It can be concluded that supplementation with calcium, a combination of calcium plus vitamin D supplementation and the combination of calcium and vitamin B6 supplements are effective in treating PMS symptoms both physically and psychologically.

Keywords: *Handling Premenstrual Syndrome (PMS), adolescent girls*

I. INTRODUCTION

Premenstrual syndrome (PMS) is a collection of physical, psychological, and emotional symptoms related to women menstrual cycle. These symptoms happen before menstruation and disappear with menstrual blood discharge experienced by many women before the first of each menstruation cycle [1]. The factors that affect PMS is imbalance hormone, stress, and malnutrition [2]. The imbalance of estrogen and progesterone hormone affects various manifestation of *premenstrual syndrome* [1].

Based on WHO report (*World Health Organization*), *Premenstrual Syndrome (PMS)* has higher prevalence in Asian countries compared to West countries [3]. The research result of *American College Obstetricians and Gynecologists (ACOG)* in Sri Lanka in the year of 2012 reported that PMS symptom suffered by adolescent girls was about 65.7%. The study result of Mahin Delara in Iran in the year of 2012 found that about 98.2% women in the age of 18-27 years got 1 PMS symptom on light or middle degree. Meanwhile, PMS prevalence in Brazil is 39%, and in America 34% women suffer PMS [4]. PMS prevalence in Pacific Asia, especially in Japan, PMS is suffered by 34% of the population of adolescent girls. In Hongkong, PMS is suffered by 17% the population of adolescent girls. In Pakistan, PMS is suffered by 13% of the population of adolescent girls. In Australia, PMS is suffered by 44% of the population of adolescent girls [5][6]. The number of PMS prevalence is not affected by age, educational background, and work status [7].

The number of *premenstrual syndrome* in Indonesia reaches 85% among women in reproduction age [8]. A research done by *Pelayanan Kesehatan Ramah Remaja (PKRR)* under WHO in the year of 2005 revealed that the women problems in Indonesia are problems on menstruation (38.45%), nutrition related to anemia (20.3%), learning disorder (19.7%), psychological disorder (0.7%), and fat problems (0.5%). Menstruation disorder is the main problem faced by Indonesia women [9].

PMS symptoms happen anytime and cause high pain. The effect of PMS is increasing the number of work absence, high medical cost and low health quality because it disturbs women's activities [10] [11]. The effect of premenstrual syndrome among students' academic activities is low students concentration, increase of absence in class, and low of activities at the campus [12].

The problem of *premenstrual syndrome* faced by women has negative effects for physical health. Further, during menstruation, women need a lot of zinc substance. The need of calcium among adolescent girls has to be fulfilled because at that time the bone density determines whether it can be spared from osteoporosis. PMS is a cause of

osteoporosis [13].

A government program that has been prepared for teenagers is the distribution of a zinc tablet to tackle anemia. However, there is not any program in the prevention of PMS. Health workers, especially midwife giving midwife service to women on cycle of life have obligation in preventing and treating PMS that happen to women, especially among adolescent girls. The role of medical workers to prevent and promote PMS is by giving information and education about PMS so the number of PMS incident among adolescent girls can be reduced.

The need for medical workers to have knowledge in handling PMS is very necessary for women, especially for adolescent girls that get PMS with complaints of physical and psychological symptom so that they can be handled well. It is a reference for the writers to explore and outline all handling of PMS to adolescent girls.

On this *systematic literature review*, the writers' purpose is to conclude and examine literature related to how to handle PMS to adolescent girls based on *Evidence Based Practice*.

II. METHOD

Literature Searching: In a systematic Literature Review, this was done by identifying literature studies through the following steps:

1. Making the framework as a basis in determining inclusion and exclusion criteria so that the data search is not expanded and focuses on the context.
2. Developing keywords that are designed and focused on the framework.
3. Inserting *keyword* into search engine in the database of *Pubmed*, *Ebsco* dan *Proquest*. On database *Pubmed*, *Ebsco* and *Proquest*, the filter is set in web as well as filter *Full Text*, *Data Publish in 10 years ago*, *Human*, and English language.
4. Noting the database finding result, i.e. *Pubmed* 90 articles, *Ebsco* 4 articles and *Proquest* 185 articles.
5. Saving database web to storage machine in *bibliography Mendeley*. In *Mendeley*, the data are put in a folder.
6. Saving and filtering the data based on *framework*. Articles that are not in accordance are taken out from the folder "relevant"
7. Noting the finding of a sum of articles and filtering process is discussed in Prisma Flow Diagram.

The researchers find 279 articles. There is an article identified as duplication. Therefore, in total there are as many as 278 articles. A number of articles are shifted or issued because the title is not suitable with the framework, i.e. as many as 123 articles. There are also 111 unsuitable abstract framework, 2 anonymous articles, 2 articles not written in English, 12 articles with unsuitable method with framework, and 18 articles in the form of review. Therefore, there are less than 18 articles. Ten articles are in full text access and filtered based on framework and there are three articles with suitable results in accordance to the framework. Seven articles have complete text while 1 article is not suitable with the inclusion criteria. Six appropriate articles will have extraction data analysis. After the extracted result is found, the next step is "*Critical Appraisal*" for the

discussion chapter. The following is the diagram of Prisma flow:

Fig 1. PRISMA Flow chart

Critical appraisal in literature has been eliminated from inclusion criteria. To reveal the quality of the study, the researchers use *Critical Appraisal Skills Program* (CASP).

TABLE I. DATA EXTRACTION

No	Title/Writer/Year of Publication/Level/Country/Journal	Aim	Research Design	Sample Size	Result
1	<i>Effects of calcium supplement therapy in women with premenstrual syndrome/Zinat Ghanbari, Fedieh Haghollahi, Mamak Shariat, Abbas Rahimi Foroshani, Maryam Ashrafi/2009/Q3/ Tehran, Iran/Taiwan J Obstet Gynecol</i>	This research purpose was to evaluate the effect of calcium supplement therapy on PMS symptom.	RCT	This research used control experiment chosen single, blind and random to adolescent girls with PMS. The number of the sample used by both of the groups is 179 women.	This study showed that giving calcium supplement intervention have some positive effects that help reduce initial exhaustion symptom, change in appetite and depressive symptoms in PMS women compared to the control group.
2	<i>Effect of treatment with dydrogesterone or calcium plus vitamin D on the severity of premenstrual syndrome/Marjan Khajehei, Khadijeh Abdali, Mohammad Ebrahim Parsanezhad, Hamid Reza Tabatabaee/ 2009/Q2/Shiraz, Iran/ International Journal of Gynecology and Obstetrics</i>	This research was designed to compare dydrogesterone effect and calcium added with vitamin D to women with premenstrual syndrome (PMS)	RCT	This research used control experiment chosen single, blind, and randomly random to PMS adolescent girls. The samples are 3 groups as many as 180 PMS women.	This study showed that giving treatment with dydrogesterone and combination with calcium supplement plus vitamin D have same positive effects that help reduce initial exhaustion symptom to women compared with placebo.
3	<i>Effect of Combined Use of Calcium and Vitamin B6 on Premenstrual Syndrome Symptoms: A Randomized Clinical Trial/ Seyedeh Zahra Masoumi, Maryam Ataollahi, Khodayar Oshvandi/ 2016/Q2/Hamadan, Iran/ Journal of Caring Sciences</i>	This research was to test the impact on the use of calcium combination and vitamins B6 to premenstrual syndrome (PMS) symptom.	RCT	This research was conducted involving female students from Hamadan University of Medical Science, the number of the students that participate in the research and is included in the inclusion criteria are 76 students. They are divided into two groups, i.e. intervention group 38 students and control group 38 students.	This study showed that the use of calcium combination and Vit.B6 is more effective in controlling PSM symptom to women compared with placebo.
4	<i>Calcium Versus Oral Contraceptives Pills Containing Drospirenone for the Treatment of Mild to Moderate Premenstrual Syndrome: A Double Blind Randomized Placebo Controlled Trial /Nesreen A.A. Shehata /2016/Q1/Beni Suef, Egypt/Obstetrics & Gynecology</i>	This research compared the impact of calcium supplement compared with combined oral contraceptive pill (COC) that contains drospirenone in treating premenstrual syndrome (PSM).	RCT	This research involved PMS women chosen from Beni-Suef University Hospital, the total number of the women that join the research and is in the inclusion criteria is 210 women. They are divided into three groups, that is intervention group with COC 70 women, the group intervention with calcium plus vitamins D 70 women, and control group (placebo) 70 women.	This study showed that giving COC and calcium combination plus Vitamins D have the same effect in reducing PMS symptoms to women compared with placebo. COC is found to be more effective.
5	<i>Effect of calcium on premenstrual syndrome: a double-blind randomized clinical trial /Fateme Shobeiri, Fahimeh Ezzati Araste, Reihaneh Ebrahimi, Ensiyeh Jenabi, Mansour Nazari /2017/Q3/Hamadan, Iran /Obstetrics & Gynecology Science</i>	This research was aimed to evaluate calcium effect to premenstrual syndrome.	RCT	This research involved female students from Hamadan University of Medical Science, the total number of students that join the research and is in the inclusion criteria is 66 students. They are divided into two groups, i.e. intervention group 33 female students and control group 33 female students.	This study showed that giving COC and calcium supplement intervention was effective treatment to reduce mood disorder during PMS compared with control group.
6	<i>Treatment of Premenstrual Syndrome: Appraising the Effectiveness of Cognitive Behavioral Therapy in Addition to Calcium Plus Vitamin D. /Zahra Karimi, Mahnaz Aliakbari Dehkordi, Ahmad Alipour, Tayebeh Mohtashami /2018/Q1/Tehran, Iran/PsyCh Journal</i>	The purpose of the research was to assess the effectiveness of cognitive behavior therapy to calcium supplement plus vitamins D.	RCT	This research involved students from three universities in Teheran, the total number of the students that participate in the research and is in the inclusion criteria is 70 women. They are divided into two groups, intervention group 55 women and control group 15 women.	This study showed that giving CBT combination intervention and calcium plus Vitamins D are effective in reducing the aspect of physiological and somatic symptoms, such as PMS's pain compared without intervention (placebo).

III. RESULT

A. Calcium Supplement to Premenstrual Syndrome

A journal with the title “*Effects of Calcium Supplement Therapy in Women with Premenstrual Syndrome*” written by Zinat Ghanbari, Fedieh Haghollahi, Mamak Shariat, Abbas Rahimi Foroshani, and Maryam Ashrafi explains about the effectiveness of Calcium Supplement to *Premenstrual Syndrome* for women. The finding shows that 2x500 mg Calcium Supplement a day for 3 month helps reduce initial exhaustion, the change of appetite and depression to PMS women. Calcium supplement therapy is a safe method, effective and comfortable to reduce the intensity and frequency of PMS symptoms to recover life quality. Calcium supplement do not give significant changes to PMS symptoms such as breast pain, headache, uneasiness, irritable changes in sleep patterns, and lack of energy [14]

Another journal with the title “*Effect of Calcium on Premenstrual Syndrome: A Double-Blind Randomized Clinical Trial*” written by Fatemeh Shobeiri, Fahimeh Ezzati Araste, Reihaneh Ebrahimi, Ensiyeh Jenabi, and Mansour Nazari tells about the effectiveness of Calcium Supplement to *Premenstrual Syndrome* for women. The finding research showed that 1x500 mg Calcium supplement a day in 2 months can reduce anxiety, depression, emotionally transformative, water retention and somatic change. This research result indicates that treatment with calcium supplements is an effective method to reduce a mood disorder during PMS [15].

B. Combined Oral Contraceptive (COC), Calcium Supplement Plus Vitamins D To Premenstrual Syndrome

A journal with the title “*Effect of Treatment with Dydrogesterone or Calcium Plus Vitamin D on the Severity of Premenstrual Syndrome*” written by Marjan Khajehei, Khadijeh Abdali, Mohammad Ebrahim Parsanezhad, and Hamid Reza Tabatabaee gives evidence on treatments with 2x5 mg *dydrogesterone* or 2x500 mg calcium plus 2x200 mg vitamins D for 10 days in 2 menstruation cycles. The research result shows that COC, and calcium supplement plus vitamins D have the same effect to cure PMS symptoms and the side effects of giving COC intervention to PMS are nausea and constipation while the calcium supplements and vitamin D do not have side effects [16].

An article titled “*Calcium Versus Oral Contraceptive Pills Containing Drospirenone for the Treatment of Mild to Moderate Premenstrual Syndrome: A Double Blind Randomized Placebo Controlled Trial*” composed by Nesreen A. A. Shehata provides initial evidence that COC (3 mg drospirenone + 0.03 mg etinil estradiol) and 400 mg calcium plus 400 IU vitamin D for 21 days beginning on the day of the third menstruation shows no symptom of PMS in adolescents from middle to light. On intervention group, COC is reported to cause side effects among 3 people who have headache, 2 people suffer irregular bleeding, and 1 person experiences nausea. Such condition occurs because the COC disrupts estrogen. Therefore, the side effects can be increased. COC is not suitable for women who want fertility. The other group does not report the side effects. Therefore, calcium supplements plus vitamins D are safer (has no side effects) and effective in recovery PMS in adolescents girls [17].

C. Calcium Supplement and vitamin B6 to

Premenstrual Syndrome

An article with the title “*Effect of Combined Use of Calcium and Vitamin B6 on Premenstrual Syndrome Symptoms: A Randomized Clinical Trial*” written by Seyedeh Masoumi, Zahra Mary Ataollahi, and Khodayar Oshvandi provides evidence that there is the effectiveness of vitamin 40 mg and vitamin B6 compared to combination of 500 mg calcium supplements and 40 mg of vitamin B6 given 2 times a day for 2 months to decrease physical symptoms (breast pain, abdominal cramping flatulence, swollen, acne, increased appetite, headache, back pain and sleep disorders) and symptoms of psychology (tension, uneasiness, cry, angry, depression, hypersensitivity, not concentrating enough, tired, fatigue, mood changes) among women with PMS. To reduce PMS symptoms, it is more significant in the group of calcium combined with vitamins B6 compared to group with only vitamins B6 [18].

D. CBT, calcium supplement plus vitamins D to Premenstrual Syndrome

An article entitled “*Treatment of Premenstrual Syndrome: Appraising the Effectiveness of Cognitive Behavioral Therapy in addition to Calcium Supplement plus Vitamin D*” written by Zahra Karimi, Mahnaz Aliakbari Dehkordi, Ahmad Alipour and Tayebeh Mohtashami provides evidences that there is an influence in relation to the combination therapy CBT for 45 minutes per week and 500 mg calcium supplements plus 200 IU vitamins D for 2 months. It has long term positive effects because CBT is a self-therapy that includes relaxation and negative mind and attitude control.

The therapy can improve performance and welfare women social with PMS in the long term, and the giving of calcium supplements and vitamin D as a supplement helps deprive the physiological and somatic symptoms, such as pain, during the period of premenstrual. Therefore, it can increase the quality of life of women in family activity, education, and workplace. CBT implementation has constraints in it culture and the local environment related culture factor could affect CBT [19].

IV. DISCUSSION

A. Calcium Supplements to Premenstrual Syndrome

A research conducted by Ghanbari et al. (2009) reveals that calcium supplements have been evaluated as a treatment for PMS in adolescent girls. Women with PMS and volatility mood are associated with changes of menstrual cyclic. A clinical trial double-blind done randomly in 179 among university students in Teheran who fulfilled the criteria of inclusion for PMS without another psychiatry diagnosis finds a decrease in 50 % symptoms – the symptoms of PMS such as depression, appetite and fatigue, but it does not show significant changes on the symptoms such as breast pain, headache, uneasiness, irritation, changes in sleep pattern and lack of energy in adolescent girls who get doses of 500 mg calcium twice a day for three months [14].

The difference in the effectiveness of calcium supplements therapy to PMS symptoms in teen girls which arises is probably because of differences in sample size, symptoms of headache, duration of treatment, doses of supplements

of calcium, or the number of cases to symptoms of a sleep disorder. It leads to the need of further research. The total sample reinforces the reference to the calcium supplements therapy to the differences in the PMS symptoms on adolescent girls.

A research conducted by Shobeiri et al. (2017) reveals the effectiveness of calcium supplements with low dosage in recovering PMS in adolescent girls. A clinical trial double-blind randomized involves 66 students at Hamadan University of Medical Sciences in West Iran who fulfilled the inclusion criteria of not getting hormone therapies at the time the research was held experience symptoms at least 5 PMS. They have no psychological issues. The intervention and control group have the same characteristics in terms of menarche age, dysmenorrhea age, menstrual duration, menstrual intervals, body mass, index of regular menstrual cycle and regular sports activity. The intervention group was given 1x500 mg calcium supplements and the control group was given a placebo after lunch in 2 cycles [15].

The effectiveness of each group is evaluated in relation to PMS symptoms. The PMS symptoms are divided into groups, i.e. anxiety (stress, irritability and anxious), depression (depression and exile, socially inactive, crying, impatience, wanting to stay home, anger, forgetfulness, insomnia and lack of concentration), emotion changes (liking sweet food, palpitation, weakness, energy decline, increased appetite and exhaustion), water retention (breast pain, swelling feet, flatulence, pain and discomfort), and somatic change (cold, nausea, urination, hot flashes, back pain, headache, acne, oiliness, joint pain and muscle pain) [15].

The result shows that there is a significant difference to PMS symptoms such as depression, changes in emotion and somatic changes in the intervention group and there is no significant difference in water retention. As a whole, this research result indicates that the treatment of PMS in adolescent girls with calcium supplements is an effective method to reduce mood disorder during PMS [15].

Premenstrual syndrome is disorder often experienced the many teenagers. It happens in some days up to two weeks before menstruation and declines after the menstrual period. The most common symptoms of PMS include flatulence, breast pain, anxiety, crying easily, depression, fatigue, lacking of energy, irritability and being easily offended and change of appetite.

A result inference on research shows that treatment of PMS with calcium supplements significantly treats PMS symptoms such as initial exhaustion, appetite, mood disorder and depression. Calcium supplements effects on PMS have correlation with serotonin production and tryptophan metabolism. Calcium causes fluctuations cyclic for the menstrual cycle which inflicts some of PMS symptoms. Hormone produced in the ovary influences the metabolism of calcium, magnesium, and vitamin D. Estrogen regulates metabolism calcium, calcium absorption in the intestines. Fluctuations cause menstrual cycle. Calcium homeostasis changes (hypokalemia and hyperkalemia) have long been connected to various disorders. The level of estrogen that rises in phase luteal causes blood levels of calcium to decline.

B. Combined Oral Contraceptive (COC), Calcium supplements plus vitamin D to Premenstrual Syndrome

Premenstrual Syndrome (PMS) is one of natural disorders that happen among some women. The symptoms are one of the problems for women. The symptoms can survive for up to 2 weeks before menstrual cycle. Various symptoms such as emotional, behavior and physical one can happen. The symptoms of PMS will decrease after a period of menstrual. The symptoms that could be felt have negative impacts on physical fitness and social functions [16].

The research conducted by Khajehei et al. (2009) shows that treatment with dydrogesterone or calcium plus vitamin D has the same effect against PMS in adolescent girls. A clinical trial in a double-blind randomized involves 180 students from Shiraz University who fulfill the criteria of inclusion that is the menstrual cycle is an orderly 3-8 days, (long day menstruation between interval 22-35 days), not in the process of drug consumption (hormonal contraception, antipsychotic or vitamin), not in the group contraindication dydrogesterone or calcium supplements and vitamins D. Intervention group is given 2x50 mg dydrogesterone and group of intervention ii is given 2x500 mg calcium supplements + 200 mg of vitamins D while the control group is given a placebo for 2 menstrual cycles.

The research results show that the comparison treatments between 3 groups are dydrogesterone group and supplement calcium group plus vitamin D has significant effect in relieving the symptoms of PMS compared to placebo group. A decrease in the symptom of PMS on groups dydrogesterone which is the most striking is on assisting a person's emotional and physical symptoms which include a decrease in concentration, anger, arthralgia and weight loss. A decrease in the symptom of PMS of group with calcium supplement and vitamin D which is the most striking is in assisting a person's emotional and physical symptom which includes a decrease in concentration, disturbed relation, anxiety and arthralgia. The provision of dydrogesterone reports there are 31 persons who experience the side effects on the first month and there are 36 participants who experience it in the second month. The side effects include nausea and constipation. In the other groups, there are no side effects [16].

A research done by Shehata (2016) finds that the treatment to pills KB combination (coc/combined an oral contraceptive) or calcium plus vitamin D have the same effect to PMS in adolescents girls. A clinical trial double-blind in randomized involve 210 students of Beni Suef-University who fulfill the criteria of inclusion of having a regular menstrual cycle, having no disease of psychiatric disorders and having PMS complaints. Group intervention i is given coc (3 mg drospirenone + 0.03 mg etinil estradiol), and the intervention ii is given 400 mg a supplement calcium + 400 iu vitamin D while the control is given a placebo every day for 21 days from the 3rd day menstrual for three months [17]

The research results show that coc or calcium supplements plus vitamin D supplements equally provide benefits in treating physical and psychological symptoms of PMS. Coc or calcium

supplements plus vitamin D effectively deprive PMS symptoms which include flatulence mastalgia, headache,

weight and swelling. However, giving COC to intervention group 1 is reported to have side effects, i.e. 3 people have headache, 2 people have irregular bleeding, and 1 people have nausea. The other groups do not get side effects [17].

In conclusion, the research results show that treatment PMS with coc or calcium supplements plus vitamin D significantly treat PMS symptoms such as: flatulence, mastalgia, headache, weight loss and swelling. The use of contraceptive pill (dydrogesteron and coc) as PMS treatments on adolescent girls can generate side effects such as nausea, constipation, headache and irregular bleeding. Meanwhile the treatment of PMS with vitamin D. does not cause side effects.

C. Calcium supplements and vitamin B6 to Premenstrual Syndrome

The research of Masoumi et al. (2016) finds that treatment with a combination of calcium supplements plus vitamin b6 has good effect against adolescent girls of PMS. A clinical trial that involves 76 students double-blind randomized in Hamadana university of medical sciences major which satisfy the criteria of inclusion of 20-30 years of age, having a menstrual cycle (regular 3-10 days, between interval 21-35 days), having no mental illness, not having a history of diseases such as diabetes, seizure disorders, hypothyroidism, not having the death of close relative (grieving for 3 months, there is no research operations in 3 months before research, not using antidepressant drugs, hormonal contraceptives, progesterone, medroxy acetic and a vitamin in 3 months. The intervention group is given 2x500mg + calcium supplements and 40 mg of vitamin B6 while the control group receives 2x40 mg of vitamin B6 for 2 months.

The results show that the supplements of calcium plus vitamin B6 can similarly recover adolescent girls of PMS symptoms. Physical symptoms of PMS include breast pain, stomach cramps, bloating, swelling, acne, increased appetite, headache, back pain and sleep disorders. The psychological tension of PMS symptoms include uneasiness, crying, irritability, depression, hypersensitivity, not concentrating enough, fatigue, mood changes and anger. The intervention group is given combination of calcium supplements and vitamin B6 which significantly can alleviate symptoms in teen daughter of physical and psychological symptoms of PMS while the control group which is given only vitamin B6 alone can relieve the symptoms of psychological on adolescent girls of PMS symptoms [18].

The conclusion of the research results above shows that the treatment of PMS with calcium supplements and vitamins B6 can significantly treat PMS symptoms. The treatment of a combination of a supplement calcium plus vitamin B6 is better in controlling PMS symptoms compared to vitamin b6. It is because combination of calcium supplements and vitamins B6 can control PMS symptoms both physically and psychologically. Meanwhile, vitamin b6 only controls psychological symptoms. Calcium supplements and vitamins B6 have a critical role in mood changes, especially depression and psychological imbalance. The effect of this relates to the production of serotonin and metabolism tryptophan.

D. CBT, Calcium Supplements Plus Vitamin D To Premenstrual Syndrome

Karimi's et al. research (2018) finds that treatment with cbt and consumption of supplement calcium plus vitamin d has a good effect against PMS in adolescent girls. A clinical trial in randomized involves 40 students of 3 universities in Teheran that fulfill the criteria of inclusion of the age 22-48 years, not an athlete, having no physical disease and psychology and not consuming medicine, undergoing no operations in the last 3 months, having no experience of heavy stress during the last three months, having a regular menstrual cycle (three to ten days, menstrual between intervals 21-35 days. The group intervention I is given exercise cbt for 45 minutes every week. Group intervention ii is given 2x500 mg supplement calcium plus 2x200 iu vitamin d. Group intervention iii is given a combination of exercise cbt for 45 minutes a week and 2x500 mg a supplement calcium plus 2x400 iu vitamin d. Meanwhile the other is not given any intervention. The intervention is given for about two months [19].

The results show that combination of exercise and supplements cbt calcium plus vitamin D can increase a score function and lower depression in women with PMS without defining the frequency and duration. Therapy training and cognitive behavior therapy based revenue can help reduce PMS symptoms. Cbt is a technique that challenges and reconstructs the idea and faith of an individual. It can reduce stress. As a result, it can help alleviate depression caused by PMS as interference which is unrestrained and paralyzing. Other techniques of cbt are advantageous to learn manners as effective ways to reduce the feeling of depression experienced by women with PMS. Women can gain knowledge on anger management by having awareness of the situation, know how people experience anger, and adjust the style to express anger as well as an unpleasant experience. Meanwhile, calcium supplements plus vitamin D supplements as the supplements help lose physiological aspect and PMS somatic symptoms such as pain during premenstrual period. Therefore, the treatment of PMS is done with CBT combination and calcium supplements plus vitamins D that have more effectivity to improve the quality of women's life in family, education, and workplace. There need to be continued research to support the use of CBT as the first line in recovering PMS [19].

This research has limitation in terms of the duration of the study in which short intervention can hinder the effectiveness of detection cbt and therapeutic calcium supplements and vitamin d. The influence of cbt in the lifestyle and relationship of the women are not evaluated. Culture and local research can affect the size of small cause heterogeneity sample sectarian. There needs to be cooperation between counselors, psychologists and doctors in the application of the method in this research [19]

V. CONCLUSION

Based on literature review that found writer handling PMS in adolescents girls based on based Evidence Based Practice that are:

1. Giving the calcium supplements, combination calcium supplements plus vitamin D and combination supplement calcium and vitamin B6 effective in treating PMS good physical symptoms and

psychological..

2. Giving COC on PMS generate side effects such as nausea, constipation, headache and bleeding irregular, so less effective and are not recommended in treating PMS
3. Giving CBT exercise need research long time duration, small cause heterogenitas sample sectarian, and need cooperation between counselor, psychologist and the doctor the. The exercise cbt not effective in the treatment of PMS in adolescents in handling the need to pay attention to and the doses in discharging to effective. PMS handling based on Evidence based Practice also needs to consider the method and system in the implementation of cbt exercise.
4. In handling PMS in adolescents girls should pay attention to the dose and the rules in discharging that can be effectively. The handling of PMS based on *Evidence Based Practice* also need to consider the way and methods in its implementation, not all the handling of can be applied in cases of PMS because depend on the patient condition and the surrounding environment that support

“Effect of calcium on premenstrual syndrome : A double-blind randomized clinical trial.” vol. 60, no. 1, pp. 100–5, 2017.

- [16] M. A. Zadeh, M. Khajehi, and F. Sharif, “High-risk pregnancy: effects on postpartum depression and anxiety,” *Br J Midwifery*, vol. 20, no. 2, pp. 104–13, 2012.
- [17] N. Shehata, “Ac ce p t e d c r t .,” *Eur J Obs. Gynecol [Internet]*, vol. 01, p. 015, 2016.
- [18] S. Masourni, M. Ataollahi, and K. Oshvandi, “Effect of Combined Use of Calcium and Vitamin B6 on Premenstrual Syndrome Symptoms : a Randomized Clinical Trial.” vol. 5, no. 1, pp. 67–73, 2016.
- [19] Z. Karimi, M. Dehkordi, A. Alipour, and T. Mohtashami, “Treatment of premenstrual syndrome: Appraising the effectiveness of cognitive behavioral therapy in addition to calcium supplement plus vitamin D.” 2018.

REFERENCES

- [1] S. Smeltzet and B. Bare, *Buku Ajar Keperawatan Medikal Bedah Brunner & Suddarth . Edisi ke-12*. Jakarta: EGC, 2013.
- [2] T. Anthony, *Health Media Nutrition Series. Women and Nutrition*. Jakarta: Sinar Grafika Offset.
- [3] S. Mohammadirizi and M. Kordi, “Association between menstruation signs and anxiety, depression and stress in school girls in Mashhad in 2011-2012,” *Iran. J. Nurs. Midwifery Res.*, 2013.
- [4] A. Bashir, U. Bahrin, and I. Idris, “Peran High Sensitivity C-Reactive Protein (hs-CRP) sebagai penanda inflamasi, indeks massa tubuh dan lingkaran pinggang terhadap derajat Premenstrual Syndrome pada wanita usia subur,” 2011.
- [5] E. Bergel, L. Gibsons, M. G. Rasines, A. Luetich, and J. Belizan, “Maternal Calcium Supplementation During Pregnancy and Dental Caries of Children at 12 Years of Age: Follow-up of a Randomized Controlled Trial. *Acta Obstet Gynecol. Scand.*,” vol. 89, pp. 1396–1402, 2010.
- [6] D. Sylvia, *Syndrome Pra-Menstruasi*. Jakarta: : Balai Penerbit FKUI, 2010.
- [7] J. Potter, J. Bouyer, J. Trussel, and C. Moreau, “Premenstrual Syndrome prevalence and fluctuation over time: results from a french population based survey,” *J Women Heal.*, vol. 18, no. 1, pp. 31–39, 2009.
- [8] Suparman and Ivan, *Premenstrual Syndrome*. Jakarta: Buku Kedokteran EGC, 2011.
- [9] S. Damayanti, *Faktor-faktor yang berhubungan dengan premenstrual syndrome pada mahasiswa D-4 Kebidanan di Sekolah Tinggi Ilmu Kesehatan U’budiyah Banda Aceh*. 2013.
- [10] G. Allais *et al.*, “Premenstrual Syndrome and Migraine,” *Neurol*, vol. 33, no. 1, pp. 111–115.
- [11] M. Oberman, “Motherhood, Abortion, and the Medicalization of Poverty,” *J Law Med Ethics [Internet]*, vol. 46, no. 3, pp. 665–71, 2018.
- [12] Ramadani and Mery, “Premenstrual Syndrome (PMS).,” *J. Kesehat. Masy.*, vol. 7, no. 1, 2012.
- [13] A. Bendich, “Micronutrients in womens health and immune function nutrition,” vol. 17, no. 10, pp. 858–67, 2011.
- [14] Z. Ghanbari, F. Haghollahi, M. Shariat, and A. Foroshani, “EFFECTS OF CALCIUM SUPPLEMENT THERAPY IN,” *Taiwan J Obs. Gynecol [Internet]*, vol. 48, no. 2, pp. 124–9, 2009.
- [15] F. Shobeiri, F. Araste, R. Ebrahimi, E. Jenabi, and M. Nazari,