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THE IMPACT OF LIFESTYLE MODIFICATION ON THE IMPROVEMENT OF ADOLESCENT REPRODUCTIVE DISORDER WITH PCOS : A LITERATURE REVIEW

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Abstract

Background: Polycystic ovarian syndrome (PCOS) is described as a symptom of disturbances in the aspects of reproduction and metabolism. Reproductive disorders usually manifest as hyperandrogenism, irregular ovulation, and polycystic ovaries, leading to reduced fertility. **Methods:** This was a literature review study that writes briefly, concisely, and up to date on a topic from scientific publication articles. Articles were compiled by conducting a library search through Google Scholar and ScienceDirect from 2013-2022 with a total of 7 articles. **Results:** A descriptive review of articles states that therapy for improving body metabolism aims to improve the function of reproductive hormones so that lifestyle changes become a support for therapy for women with PCOS for changes in reproductive hormones in connection with the successful ovulation of teenage girls with PCOS. A healthy lifestyle ranging from health education about reproductive health, exercise, and nutritional diet is important for healthy reproductive function. **Conclusion:** Preparation for the reproductive health of premarital adolescents is very important for the preparation of healthy reproduction during pre-conception after marriage, therefore it is necessary to prevent PCOS from occurring or if you have experienced PCOS there are improvements to overcome PCOS disease.

Keywords: PCOS, Reproductive Disorders, Lifestyle Modifications

INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is an endocrine disorder that commonly occurs inadolescents and women of reproductive age characterised by anovulation caused by reproductive endocrinology dysfunction (Wang *et al.*, 2016; Haidari *et al.,* 2020). *Polycystic ovarian syndrome* (PCOS) is described by the conditionof symptoms of disorders in reproductive and metabolic aspects. The metabolic aspect usuallypresents as increased body weight and insulin resistance, with an overall increased likelihood of diabetes, hyperlipidaemia and cardiovascular disease. Reproductive disorders usually manifest as hyperandrogenism, irregular ovulation,

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and polycystosis in the ovaries, which in turn can lead to decreased fertility. Chronic treatments targeting metabolic and reproductive syndromes with metformin or oral contraceptives (Shah *et al.*, 2021).

The prevalence of PCOS in adolescents based on a meta-analysis study based on the *National Institute of Health* (NIH) is estimated at 3.39% and based on Rotterdam criteria is 11.4% (Abdolahian *et al.*, 2020). According to the *World Health Organization* (WHO), infertility is a disease of the reproductive system defined by the failure to achieve clinical pregnancy after 12 months or more of sexual intercourse without contraception. Data from 2015 showed 8,612 women aged 28-33 years, 5.8% of whom had PCOS and as many as 309 women with PCOS experienced infertility. This data proves that almost 72% of women with PCOS experience infertility. The incidence of PCOS in adolescents ± 11-26%, and about 50%of adolescents with PCOS are *overweight.*

PCOS begins at puberty but disruption of the ovarian source of androgen production atpuberty can begin in childhood or even during foetal development. Pathological features in adolescence are still debated, emerging diagnostic criteria such as menstrual irregularities, hirsutism, acne, and *polycystic ovarian morphology* (PCOM) usually occur in normal adolescent women and are considered physiological changes of puberty. The few treatment options for adolescent girls with PCOS that are recommended especially in the adolescent group should be safe, acceptable, and tolerable. There is insufficient data available regarding the safety of pharmacological therapies, and especially with regard to long-term use in young women with PCOS. None of the drugs are approved by the US *Food and Drug Administration*(FDA) for use in adolescents with PCOS so lifestyle modification is the first line of treatment(Abdolahian *et al.*, 2020).

The most common clinical manifestations of this syndrome include irregular menstrualcycles, infertility, acne, hair loss with a male pattern, *Insulin Resistance* (IR), and obesity. According to the Rotterdam criteria, the diagnosis of PCOS depends at least on the identification of two of the following three criteria: oligo-anovulation, hyperandrogenism, andpolycystic ovaries on ultrasound. Patients with PCOS are at increased risk for the developmentof metabolic syndrome, type II diabetes mellitus, and cardiovascular disease. While the underlying mechanism

causing PCOS remains unknown, obesity and IR appear to play a key role in the pathogenesis of PCOS. Obesity causes more than 50% of IR in patients with PCOS and is associated with different metabolic abnormalities, especially increased androgen production. Hyperinsulinaemia caused by IR leads to hyperandrogenemia through excess androgen production by Teka cells in the ovary and also reduced hepatic synthesis of *Sex Hormone-Binding Globulin* (SHBG). Adipose tissue, especially visceral fat, is associated with IR, diabetes, hypertension, and proinflammatory states. Adipose tissue also as a secretory organfor adipocytokines, such as adiponectin and leptin is involved in the pathogenesis of PCOS (Haidari *et al.*, 2020).

The lifestyle of people, especially teenagers today, tends to eat unbalanced food with more calories than the body's calorie needs and tends to have a *sedentary life style* that rarely moves and or never does sports. Both of these lead to obesity. Lifestyle modification is considered an effective and safe option and first-line treatment in adolescent girls. Lifestyle interventions, especially those that include dietary changes, behavioural therapy, exercise andphysical activity, can reduce the prevalence of obesity and hormonal disorders in adolescents. Several previous studies have stated the relationship between hormones and characteristics ofwomen with early PCOS, but research is still lacking on the effects of general treatment on hormones in PCOS to identify reproductive and metabolic functions of hormones. Treatment effects specifically target aspects of reproductive disorders (i.e., contraceptive pills or aspectsof metabolic disorders (i.e., through weight loss and intensive lifestyle modifications) or both (contraceptive pills and weight loss) (Abdolahian *et al.*, 2020; Shah *et al.*, 2021). The above background is the basis for the author to conduct a literature study on the impact of lifestyle

modification on the improvement of reproductive disorders in adolescents with *polycysticovarian syndrome* (PCOS).

METHOD

This study is a *literature review* research that writes briefly, concisely and up-to-date ona topic from scientific publication articles. The purpose of this study is to solve the problem ofreproductive disorders in adolescent girls with PCOS from the

theories reviewed. The article was compiled by searching literature sources through *Google Scholar* and *Sciencedirect* from2013-2022 with a total of 7 articles. The keywords used in the article search were PCOS, non-pharmacological therapy, and diet. *The* method used for analysis is *literature review* which identifies, assesses, and then interprets all findings in a study to answer a research question by summarising the results of the study. The search in the journal literature used the keywords PCOS, *Adolescent, Teenager, Lifestyle, Exercise, Diet original research* results in PCOS patients and in *full text* form which is *open access*.

RESULT AND DISCUSSION

Table 1 is the result of a literature review of eight articles that have been obtained andused to discuss the topic Impact of lifestyle modifications on the improvement of adolescent reproductive disorders with *polycystic ovarian syndrome* (PCOS).

Table 1 Literature extraction

No.	Title (author, year)	Methods	Results
1	Weight Loss and Lowering Androgens Predict Improvements in Health-Related Quality of Life in Women With PCOS (Dokras et al., 2016)	D: *Randomised Control Trial* (RCT) S: 132 women aged 18-40 years; BMI: 27-42 kg/m2) with PCOS defined by Rotterdam criteria. V: Continuous oral contraceptive pill or intensive lifestyle intervention or combination for 16 weeks and reduction in hyperandrogenism, mood and anxiety disorders in women with PCOS I: PCOSQ and Prime-MD MHQ questionnaires A: Pearson correlation coefficient, logistic regression and ANOVA	Weight loss and contraceptive pill use resulted in significant improvements in several physical and mental domains related to quality of life, depressive symptoms, and anxiety disorders, and combination therapy was beneficial in overweight/obese women with PCOS.
2	Benefit of Delayed Fertility TherapyWith Preconception Weight Loss Over Immediate Therapy in Obese Women With PCOS (Legro *et al.,* 2016)	D: *Randomised Control Trial* (RCT) S: 329 overweight/obese and infertile 18-40 year old women with PCOS. V: immediate treatment with clomiphene from Pregnancy to delay treatment with clomiphene after preconception treatment with continuous oral contraceptives, lifestyle modification (Lifestyle:	These data suggest a benefit of improved ovulation and live births with delayed infertility treatment with clomiphene citrate when preceded by lifestyle modification with weight loss compared with immediate treatment. Pretreatment with oral contraceptives is less likely to have an effect on ovulation and live birth rates compared with

		including calorie restriction, anti-obesity medications, behaviour modification, and exercise) as well as a combination of both Treatment of Hyperandrogenism VersusInsulin Resistance and Live birth, miscarriage, and ovulation. I: Lab results A: Linear regression	immediate treatment.
3	Comparison of Drospirenone- with Cyproterone Acetate-Containing Oral Contraceptives, Combined with Metformin and Lifestyle Modifications in Women with Polycystic Ovary Syndrome and Metabolic Disorders: A Prospective Randomised Control Trial (Wang et al., 2016)	D: Randomised Control Trial (RCT) S: 99 women with PCOS and metabolic disorders between January 2011 and January 2013 V: DRP-containing COC, and CPA-containing COC therapy combined with metformin (1.5 g/day) and lifestyle modification (diet and exercise) for 6 months. I: Lab results A: Wilcoxon test and paired T-test	Combination therapy of COC, metformin, and lifestyle modification in patients resulted in a significant reduction in BMI score, acne, and hirsutism.
4	A Comparison of a Pulse-Based Diet and the Therapeutic Lifestyle Changes Diet in Combination with Exercise and Health Counselling on the Cardio-Metabolic Risk Profile in Women with Polycystic Ovary Syndrome: A Randomised Controlled Trial (Kazemi et al., 2018)	D: Randomised Control Trial (RCT) S: Women aged 18-35 years diagnosed with PCOS from April 2011 - June 2016 in Canada. V: Lifestyle changes and metabolic-heart risk I: Lab results, questionnaires A: ANOVA	Dietary intervention without prescribed energy restriction, where aerobic exercise is part of a healthy lifestyle programme, and health counselling is provided, a pulses diet (Pulse-Based Diet) is more effective than a TLC diet (Therapeutic Lifestyle Changes) for improving insulin response to OGTT, TG levels, LDL-C ratio, HDL-C, TC/HDL-C, and diastolic blood pressure, which may translate to better cardiometabolic risk profile and DM2 in women with PCOS.

5	Relationship between Diet and Risk of Polycystic Ovary Syndrome in Adolescents (Irene et al., 2020)	D: Analytical descriptive observational with a cross-sectional study design. S: 150 adolescent girls studying at the Faculty of Medicine, Sriwijaya University and senior high school aged 15-19 years old V: Polycystic ovary syndrome (PCOS) and adolescent diet. I: Food recall and nutrisurvey questionnaires for calorie and macronutrient intake calculation A: Descriptive	There is a significant association between calorie intake, excessive carbohydrate, protein, and fat consumption, and insufficient fibre consumption and the risk of Polycystic Ovary Syndrome (PCOS) in adolescents aged 15-19 years in Palembang City.
6	The effects of flaxseed supplementation on metabolic status in women with polycystic ovary syndrome: a randomised open labelled controlled clinical trial (Haidari et al., 2020)	D: Randomised Control Trial (RCT) S: 41 patients with PCOS V: Flaxseed group showed significant reduction in body weight, insulin concentration, Homeostasis Assessment of HOMA-IR, Triglycerides (TG), hs-CRP, and leptin and an increase in QUICKI, High Density Lipoprotein (HDL), and adiponectin. Flaxseed supplementation also led to a significant decrease in insulin, HOMA-IR, TG, hs-CRP, Interleukin 6 (IL-6), and leptin concentrations and an increase in QUICKI, HDL, and adiponectin compared to the control group. A: Mann-Whitney U test, Wilcoxon signed-rank test and ANOVA	Flaxseed supplementation plus lifestyle modification is more effective than lifestyle modification alone on biochemical and anthropometric variables in patients with PCOS.
7	Effects of Oral Contraception and Lifestyle Modification on Incretins and TGF-ß Superfamily Hormones in PCOS (Shah et al., 2021)	D: Randomised Control Trial (RCT) S: Women with PCOS aged 18-40 years with BMI 27-42 V: Lifestyle modification for weight loss (Lifestyle), oral contraceptive only (OCP), and combined oral contraceptive and lifestyle and reproductive hormones interventions. I: Lab Results A: Spearman coefficient	Oral contraceptive pill use was associated with significant decreases in activin-A, inhibin-A, and anti-mullerian hormone (AMH), but a significant increase in FST. IGF-1, IGFBP-2, glucagon, and GLP-2 are significantly decreased. Oxyntomodulin was strongly suppressed by the contraceptive pill. Lifestyle modification alone had no significant effect, whereas the combined effect of lifestyle modification with oral contraceptive pills was almost the same as that of contraceptive pills.

1. LIFESTYLE MODIFICATION IN ADOLESCENTS WITH PCOS

The results of a literature study based on Dokras *et al* (2016) showed that weightloss and contraceptive pill use resulted in significant improvements in quality of life, depressive symptoms, and anxiety disorders, and combination therapy was beneficial in reducing overweight / obesity with PCOS. The results of Legro *et al* (2016) showed the benefits of improved ovulation with delayed infertility treatment with *clomiphene citrate* when preceded by lifestyle modification with weight loss compared to direct treatment without lifestyle modification. The combination of COC therapy, metformin, and lifestyle modification in patients resulted in a significant reduction in BMI scores, acne, and hirsutism in accordance with the results of Wang *et al (*2016). There is a significant relationship between calorie *intake*, excessive carbohydrate, protein, and fat consumption, and insufficient fibre consumption and the risk of developing Polycystic Ovary Syndrome(PCOS) in adolescents aged 15-19 years in the results of Irene *et al* (2020). (Dokras *et al.*,2016; Legro *et al., 2016;* Wang et al*.,* 2016; Irene et *al.,* 2020).

Lifestyle modifications can optimise the treatment of PCOS patients. Lifestylemodifications consisting of diet, exercise and behavioural therapy are recommended as first-line approaches in PCOS treatment (Kazemi *et al.*, 2018). Lifestyle modificationsin women with PCOS based on literature studies include dietary modification of carbohydrate foods with a low glycemic index and increased physical activity as well as regular aerobic exercise (walking and jogging) for 40 minutes per session or at least 3x/week to control body weight (Wang *et al.*, 2016).

Physical activity and behaviour modification strategies, including health education about PCOS, problem solving and self-management have been recommended as integral components of a comprehensive, successful and sustainable lifestyle change programme for women with PCOS. Aerobic exercise training, education, and health counselling on PCOS and lifestyle management are standard of care for women with PCOS. Health counselling is conducted face-to-face by an interdisciplinary team of healthprofessionals to build educated behaviour change techniques, engagement, self- monitoring, motivation, and social support of women with PCOS (Kazemi *et al.*, 2018).

The results of the study by Kazemi *et al* (2018) explain Dietary Interventions without specified energy restrictions, where aerobic exercise is part of a healthy lifestyle program, and health counselling is provided, a legume diet (*Pulse-Based Diet*) is more effective than a TLC diet (*Therapeutic Lifestyle Changes*) to improve insulin response anddiastolic blood pressure, which can be translated into better cardiometabolic and DM2 riskprofiles in women with PCOS. The results of research by Haedari *et al* (2020) showed flaxseed supplementation with lifestyle modification was more effective than lifestyle modification alone on biochemical and anthropometric variables in patients with PCOS, and the results of another study conducted by Shah *et al* (2021) showed the use of oral contraceptive pills was associated with a significant decrease in hormones and proteins supporting female reproductive function including activin-A, inhibin-A, and *anti- mullerian hormone* (AMH), a significant increase in FST (*Follistatin*), IGF-1 (*Insulin-likegrowth factor* 1), IGFBP-2 (*Insulin-like growth factor binding protein-2)*, glucagon, and GLP-2 (*Glucagon like peptide* 2) decreased significantly. Oxyntomodulin is strongly suppressed by contraceptive pills. Lifestyle modification alone had no significant effect, while the combined effect of lifestyle modification with oral contraceptive pills was almostthe same as contraceptive pill use (Kazemi *et al.*, 2018; Haidari *et al.,* 2020; Shah *et al.,* 2021).

The results of the literature review conducted by the author concluded that lifestyle modification is an important part of the therapy of women with PCOS in adolescents, whether lifestyle modification alone or with pharmacological therapy, lifestyle changes are still needed to optimise treatment. Premarital and preconception adolescence that has been carried out by research as stated in the research results of article2 to support the improvement of ovulation as a marker of fertility and vital examination ofwomen to ensure their reproductive function can be normal.

2. ADOLESCENT REPRODUCTIVE DISORDERS WITH PCOS

The menstrual cycle is the distance between the coincidence of the start of the next menstruation and the start of the next menstruation. Research Irene *et al* (2020) explainedfrom 150 primary information on young people aged 15-19 years, the

average menstrual cycle was a normal menstrual cycle, followed by an oligomenorrhoea menstrual cycle, and a very small percentage was a polymenorrhoea menstrual cycle. PCOS affects close to 2, 2- 20% of women of reproductive age. Sourced from primary information on young peopleaged 15-19 years and have menarche more than 4 years obtained from 150 illustrations, 25, 3% faced PCOS. Research from 38 respondents with PCOS, most with excessive calorie intake, most with excessive carbohydrate consumption, most with excessive protein consumption, most with excessive fat consumption. The prevalence of PCOS is greater in overweight, obese women, and up to 30% of women with a BMI of 30 kilograms/m^2 meet the diagnostic criteria for PCOS. Excess body weight affects subfertility in a woman and can affect reproductive organs that cause menstrual irregularities, subfertility, PCOS, uterine cancer, endometrial cancer, breast cancer, and cervical cancer (Irene *et al.*, 2020).

Hirsutism and menstrual problems are significantly associated with low quality of lifein adolescents with PCOS, necessitating therapeutic interventions aimed at improving these signs as well as improving overall well-being (Dokras *et al.*, 2016). Oligo Ovulation/anovulation can contribute to the incidence of abnormal uterine bleeding(PUA). The manifestation can universally take the form of a mixture of bleeding with unpredictable timing and amount of blood, with some problems leading to *Heavy Menstrual Bleeding*. Although ovulation problems often have unknown causes, many of them can be traced to endocrinopathies, one of which is PCOS (Santoso, 2016).

Premarital adolescent reproductive health - Preconception should be prepared startingfrom adolescence so that it does not prolong into Infertility. Infertility is defined as the state of not being able to conceive after one year (or more) of sexual intercourse without birth control. One of the stages of the pregnancy process is that the ovaries of the woman/wife must release the ovum or called ovulation, if there is a menstrual problem, there is most likely also a problem in ovulation if we study the occurrence of menstruation(Hurin'in *et al.,* 2020).

One of the problems of women with PCOS is ovulation and menstrual cycle. The results of the *literature review* conducted by the author show vital signs of reproductive health disorders in adolescent girls, namely menstrual disorders.

Menstrual disorders in adolescents with PCOS in the form of oligomenorrhoea and polymenorrhoea menstrual problems as well as hirsutism are associated with the quality of life of adolescents with PCOS. Menstrual disorders that are not treated properly will affect infertility due to anovulation and or oligoovulation.

3. THE IMPACT OF LIFESTYLE MODIFICATION ON IMPROVING ADOLESCENT REPRODUCTIVE DISORDERS WITH PCOS

Management of PCOS begins with explaining the importance of lifestyle changes tocorrect hormonal disturbances and the long-term effects of PCOS, as well as the therapeutic targets to be achieved. Weight loss in obese patients with PCOS is beneficial in many ways, for example it can help reduce androgen hormone levels, *Luteinizing Hormone* (LH), and insulin levels. It also helps to regulate ovulation, thereby increasing the potential for pregnancy. The incidence of PCOS is significantly affected by excessiveBMI, which in this study also illustrates that the average BMI is overweight and obese. Inthis research obtained from 38 with PCOS, most with *overweight/obese* BMI. if PCOS has 2 phenotypes are *overweight/obese* and *lean.* Nearly 80% of people with PCOS have a

BMI value above normal or large, and there are characteristics such as hyperandrogenism,polycystic ovaries, and insulin resistance. These individuals often go undiagnosed until they experience infertility problems (Irene *et al.*, 2020).

Diet is a way or effort in regulating the amount and type of food with information about the picture by including maintaining health, nutritional status, preventing and helping cure disease. PCOS patients have a tendency to consume foods with a high glycaemic index. The total daily energy intake of a woman is calculated as a percentage of the intake of the Nutritional Adequacy Rate (NAC) based on the nutritional needs of women of reproductive age. The research sample by Irene *et al* (2020) had an average daily energy intake of 82.3% of the RDA, which is 2,333 kcal/day, finding that women with PCOS have a higher calorie intake than women who do not suffer from PCOS. High fat consumption and increased protein intake are seen to be involved in abdominal obesityand impaired pancreatic function in insulin secretion, which can lead to PCOS.

Obesity contributes to the development of preconception and perinatal

morbidity inwomen and is associated with prolonged time to conception, increased miscarriage, andhigher rates of such adverse pregnancy outcomes as preeclampsia and preterm labour, inturn, leading to fetal morbidity and mortality. When coupled with other medical conditions such as diabetes or polycystic ovary syndrome (PCOS), there is synergistic deteriorationin these outcomes (7-9). Expert opinion has uniformly recommended that obese womenwith PCOS delay infertility therapy and pursue lifestyle modifications (Legro *et al.*, 2016).

In a post hoc comparison of two randomised, simultaneously conducted clinical trials to treat infertility in women with PCOS, we found that pretreatment lifestyle modifications for weight loss, with or without concomitant oral contraceptive therapy, were associated with a significant increase in ovulation rates and a greater increase in livebirth rates than immediate fertility treatment with clomiphene. Furthermore, ovulation and live birth rates were almost identical between pretreatment with oral contraceptives vs immediate treatment with clomiphene, suggesting that there is little fertility benefit to pretreatment with hormone suppression, alone or in combination with lifestyle modifications. Keeping weight normal in the oral contraceptive group further supports the conclusion that it is some aspect of weight loss intervention that leads to better outcomes.Weight loss is the simplest explanation for improved ovulation and live births (Legro *et al.*, 2016).

Lifestyle modifications including counselling and diet are done to improve PCOS. Kazemi *et al.'s* (2018) study for improvement of metabolism and insulin which will impact

reproductive function by providing education and counselling on PCOS and the benefits of lifestyle changes for PCOS for approximately four hours by a gynaecologist, MSc, and PhD researcher who has knowledge of reproductive endocrinology and clinical nutrition also each participant received standardised aerobic exercise training and was advised to exercise at least 5 days/week, for 45 minutes/day of aerobics at an intensity between 60- 75% of age-predicted maximal heart rate (e.g. 220 minus age). Exercise consisted of briskwalking, cycling training, and rowing, depending on participant preference.

PCOS is an anovulatory disease caused by reproductive endocrinological

dysfunction (Wang *et al.*, 2016). Patients with PCOS are prone to many abnormalities in their biochemical factors, especially insulin metabolism (Haidari *et al.*, 2020). The triggers of hyperinsulinaemia in women with PCOS are still unknown, possibly related toabnormalities at the level of the insulin receptor post data pathway and/or abnormal insulin secretion. It is possible that metabolic abnormalities in PCOS begin early in life, during the prenatal or prepubertal period, and early exposure to androgens during development may influence fat distribution and insulin activity. The clinical implication of this observation is that women with PCOS tend to face insulin resistance and/orhyperinsulinaemia, most notably in those who face anovulatory cycles and are overweightwith central fat deposition (Santoso, 2016).

Therapeutic improvement of the body's metabolism is improved then the function of reproductive hormones is expected to also function properly and normally, so lifestyle changes are supporting therapy in women with PCOS (Wang *et al.*, 2016). The same results mentioned that changes in reproductive and metabolic hormones in connection withthe ovulation success of adolescent girls with PCOS and preconception women with PCOSin connection with the success of live birth and with therapy to have children or pregnancyprogramme therapy (Shah *et al.*, 2021).

PCOS sufferers have 2 phenotypes, namely *overweight/obese* and *lean. Obese/overweight* adolescent girls with PCOS have a higher calorific intake derived fromconsumption of high fat, high carbohydrate and increased protein intake being a risk factor for abdominal obesity and impaired pancreatic function in insulin secretion, which can lead to PCOS. *The* results of the review article conducted by the author explain that improving hormonal disorders and long-term effects due to PCOS begins with explaining the importance of lifestyle modifications for metabolic improvement including nutritionaldiet weight loss for overweight and obesity and *exercise*. Therapeutic improvement of body metabolism for PCOS is improved then the function of reproductive hormones isexpected to also function properly and normally, improvement of metabolism and insulinwhich has an impact on reproductive function by providing education and counselling about PCOS and the benefits of lifestyle changes. Weight loss of obese PCOS patients helps reduce LH levels, androgen hormones and insulin levels so that the impact on regulating

ovulation regulation returns to normal so that reproductive disorders, especially reproductive hormonal disorders can be resolved.

CONCLUSIONS, SUGGESTIONS AND ACKNOWLEDGEMENT

Premarital adolescent reproductive health preparation is very important for healthy reproductive preparation during preconception after marriage, therefore it is necessary to prevent PCOS from occurring or if you already have PCOS there are improvements to overcome PCOS disease. A healthy lifestyle ranging from health education on reproductive health, exercise and nutritional diet is important for healthy reproductive function. Further research is needed to compare the impact of lifestyle change therapy on metabolic hormone function and reproductive hormone function.

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