



## The Mental Health in Women with Polycystic Ovary Syndrome (PCOS): A Scoping Review

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### ABSTRACT

**Background:** Women of childbearing age with Polycystic Ovary Syndrome (PCOS) are very susceptible to menstrual disorders, stress, and infertility. Psychological comorbidities are also common in women with PCOS, which impair overall quality of life. Although there has been a review of PCOS, it is not related to mental health. Therefore, it is necessary to review articles on mental health for women with PCOS.

**Purpose:** To determine the mental health of women with Polycystic Ovary Syndrome

**Methods:** This literature review applied a scoping review approach adapted to the PRISMA-ScR checklist framework. Three databases were used in the review, namely PubMed, ESHRE, and ScienceDirect. Prisma Flowchart was used for article selection and the critical appraisal referred to Joanna Briggs Institute (JBI) critical appraisal tool.

**Results:** The database search resulted in 253 relevant topics and generated 10 most relevant articles to the research objectives as the final results. These researches were conducted in various countries using various approaches ranging from qualitative research, cross-sectional study, case-control, cohort, and RCT. Three themes were obtained from the database mapping, namely determinants, effectiveness, and mental health impacts on PCOS women

**Conclusion:** Women with PCOS mostly suffered from psychological disorders, especially at the level of anxiety. There is a correlation between mental health and PCOS, which results in decreased quality of life due to stress/depression, increased anxiety, and poor sleep quality. In this case, Pioglitazone Metformin (PM) is not a sufficient treatment for the symptoms, and thus additional therapy such as cognitive-behavioral therapy (CBT) is needed as assistance.

**Keywords:** *Women of childbearing age, Polycystic Ovary Syndrome, mental health.*

## BACKGROUND

World Health Organization (Geneva: World Health Organization, 2020) released that there has been a constantly increasing rate of couples with infertility from year to year with a prediction of an increase of 15%. In general, the main culprit of infertility in women is ovulation disorders, with Polycystic Ovary Syndrome (PCOS) being the most globally common case of ovulation disorders in the field of reproductive health. This condition generates hormonal imbalances in PCOS women, which are attributed to unknown factors (Rosenfield, 2015a).

The prevalence of polycystic ovary syndrome (PCOS) varies greatly depending on the population and the diagnostic criteria. According to the European Society for Human Reproduction and Embryology/American Society for Reproductive Medicine (ESHRA/ASRM), the prevalence percentage of Polycystic Ovary Syndrome (PCOS) amounted to 15-20% (Fauser et al., 2017). In Indonesia, there has been no official record regarding the existing rate of PCOS, which indicates the number of women who suffer from polycystic syndrome. The lack of clear records to report and provide information about this case has made it difficult to create official data on PCOS.

Reproductive-age women with polycystic Ovary Syndrome (PCOS) are very susceptible to experiencing menstrual disorders, stress, and infertility. Psychological comorbidities are also common in PCOS women, with a higher prevalence of anxiety and depression impairing overall quality of life compared to women without PCOS (Kite et al., 2021).

In the prevention and control of Non-Communicable Diseases (NCD), the government has attempted to increase Health Promotion and Reduction of Risk Factors by implementing "CERDIK" behavior, in Indonesia namely "*Cek kesehatan berkala, Enyahkan asap rokok, Rajin beraktivitas fisik, Diet yang sehat dan seimbang, Istirahat yang cukup, Kelola stress*". In fact, the government does not facilitate the treatment of PCOS in the National Health Insurance as stipulated in the government regulation of the Republic of Indonesia No. 19 of 2016 concerning Health Insurance article 25 states that services to overcome infertility and mental health disorders are not guaranteed by the government. Thus, women suffering from PCOS will never receive treatment in the health care insurance. This condition has resulted in the void of attention from the government regarding this particular case (Asdaq et al., 2020).

In many cultural settings, women with difficulty getting pregnant are labeled as flawed or imperfect women and are the most to blame for a childless marriage, although in fact, infertility can also occur in men. Thus far, PCOS is only prevalent in women of childbearing age. This stigma further worsens the psychological condition of women that escalates their level of stress and leads to menstrual disorders that exacerbate the emergence of PCOS which has an impact on infertility (Evertsz, Sprangers, Kate, Stokkers, Ponsioen, Bartelsman, Bodegraven Fischer, S., et al., 2017). Several members of PCOS communities declared their presence on social media, including Verity-PCOS Charity UK and the Indonesian PCOS Fighters community. These two community groups have received countless members on Facebook. The Indonesia PCOS Fighters has housed 24,000 members, with the majority of whom being women. This community group is expected to provide its members with a place to share about PCOS problems. Therefore, a plethora of PCOS community members has shared their feelings on the platform, which is believed to be a place to obtain psychological support.

Women with PCOS commonly experience several problems that affect their psychological health, which may lead to emotional disturbances. Research by Sayyah-Melli et al. (2015) revealed that depression in women with PCOS has varying prevalence

rates of 14% and 64%. Depression affects dimensions of life and reduces the quality of life in PCOS women. This condition can lead to social isolation, impaired interpersonal relationships, incompatibility with social norms, social stigma, and suicide (Shabani et al., 2019a).

Several studies have been to investigate the quality of life and psychological health in women and girls with PCOS around the world. Although it has been found that psychological stress affects different dimensions of life in women of reproductive age with PCOS, little research has been done on this area especially in Indonesia, not to mention the lack of government attention regarding this case. Several reviews, however, have attempted to disclose this problem, including the one conducted by (Putri & Panjaitan, 2016) which focused on the sexual dysfunction of women with PCOS. This condition, thus, indicates the need for a review of the mental health of women with PCOS. The purpose of this scoping review is to generate an overview on the mental health of women with Polycystic Ovary Syndrome (PCOS).

## METHODS

This literature review was conducted using a scoping review approach according to the PRISMA-ScR guidelines, which is an extension for scoping review checklist, and one of the literature review approaches to comprehensively identify and analyze all relevant review literatures to the research question (Araújo et al., 2017). In contrast to systematic reviews and meta-analyses, scoping reviews embrace a wider scope (Munn et al., 2018a), with the aim of synthesizing research evidence and exploring issues regarding research activities related to certain topics (Peterson et al., 2017).

The scoping review consisted of the following stages according to (Kyu et al., 2018):

Step 1: Identifying scoping review questions.

Researchers improved the focus of the review and search strategy using the PEOs framework (Population, Exposure, Outcome, study) to manage and solve the focus of the review.

**Table 1. PEOs Framework**

<b>P (Population)</b>	<b>E (Exposure)</b>	<b>O (Outcome)</b>	<b>S (Study Design)</b>
Women of childbearing age	Mental health	PCOS	All studies are relevant to the topic of this review

The given PEOs framework generated the research question: “How is the mental health in women with Polycystic Ovary Syndrome (PCOS)?”

Step 2: Identifying relevant articles

After identifying the scoping review questions, the researchers identified relevant articles in the following step. This was done to determine the key parameters with the help of a database, which was based on the following inclusion and exclusion criteria:

a. Inclusion Criteria

- 1) Articles were written in English.
- 2) Articles were published between 2012 and 2021.
- 3) Articles should be the original article.
- 4) Articles could be accessed for free in full text.
- 5) Articles discussed mental health in women with PCOS.

b. Exclusion Criteria

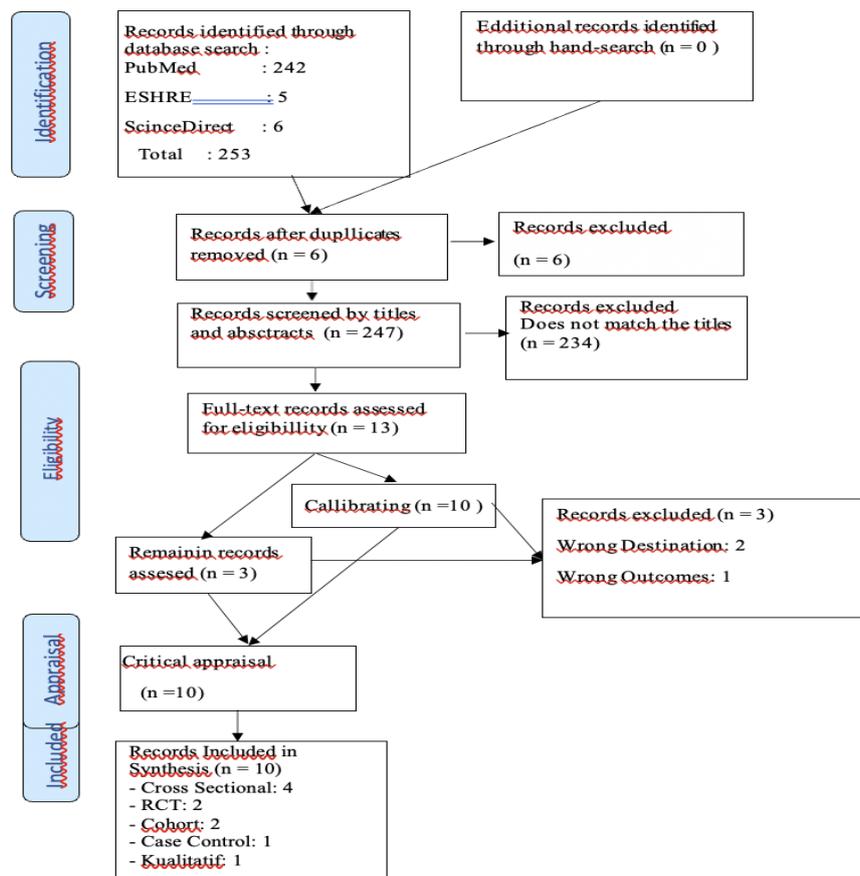
- 1) Articles were in the form of opinion papers.
- 2) Articles were about PCOS but not about mental health in PCOS women.
- 3) Articles were reviewed articles.
- 4) Articles were in the form of letters and book reviews.
- 5) Articles were in the form of report documents/guidelines.

The strategy for searching the research literature was by typing the keywords related to the PEOs framework. The search for articles in this research was done in 3 databases, namely: PubMed, ESHRE, and ScienceDirect. These databases were selected in this literature review based on the topic of discussion (Langlois et al., 2019). The database served as a basis for determining keywords (Pham et al., 2014). The specific search keywords were compiled based on a framework that referred to the Boolean operators, such as AND and OR. The keywords specified were Women\* OR women of child-bearing age\* OR adult\* AND psychology\* OR mental health\* AND Polycystic Ovary Syndrome\* OR PCOS\*.

Step 3: Articles selection

To filter articles, the researchers used Rayyan, while to select articles, the researchers used a prism flowchart, which was made to facilitate the explanation of article selection. The prism flowchart in this study is as follows:

Figure 1. Flow-ScR. Prism Diagram (Tricco et al., 2018)



Based on the results of a search using keywords and databases yielded 253 articles, the articles obtained were then extracted using the Rayyan QCRI application.

After a duplication examination, 6 articles were deleted. The next step was to filter 247 articles manually based on the title and abstract, from the results of the article screening, 234 articles were excluded because they did not meet the inclusion and exclusions criteria that have been set by researchers. The remaining 13 articles were re-filtered manually and 3 articles were excluded because the objectives and results did not match. 10 articles have met the requirements for extraction and an assessment of the quality of the articles and will be included in the charting data.

#### Step 4: Data Charting

At this stage, the data of all selected articles were then inserted into a table by including article title, author's name, year, country, purpose, type of research, data collection, participants/sample size, and results, which described in Table 2.

#### Step 5: Critical Appraisal

After determining the evidence, the next step was to extract the evidence (Pollock et al., 2021). Critical appraisal in this scoping review was conducted using the Joanna Briggs Institute (JBI) critical appraisal tool on the 10 identified articles. Afterward, the writer made the total value of the critical appraisal results for each article. The assessment using JBI resulted in 7 articles classified as poor due to the inability to answer all questions from the JBI format or because the questions in JBI format were not fully answered [A1,A4,A5,A6,A8,A9,A10] and 3 articles were deemed as very good [A2,A3,A7] because they fully answered what was provided in the question of the JBI assessment format. Most of the poorly written articles contained no confounding factors and the way to control them.

**Table 2.** Data Charting

No.	Title/Author/ Year	Country	Objectives	Types of research	Data collection	Participants/Measured Sample	Results
A1	<i>The mental health of Chinese women with polycystic ovary syndrome is related to sleep disorders, not disease status</i>  (Yang et al., 2021)	China	To comprehensively explore the relationship between these psychiatric diagnoses and metabolic parameters, and disease characteristics or sleep status in Chinese women with PCOS	Quantitative : Cross-sectional	Questionnaire: patients were directed to fill out a questionnaire related to PCOS, after signing the informed consent. The scope of the questionnaire was related to demographic characteristics, mental health, fertility history, history of gynecological diseases, sleep status, and anthropometric measures.	Respondents were selected based on the age group of around 19-42 years who were diagnosed with PCOS based on Rotterdam 2004. 433 respondents were selected as the research sample, and the Mann-Whitney U test was performed to compare continuous data that did not match the normal distribution.	This study revealed a significant correlation between anxiety/depression status and sleep conditions in PCOS patients. 26.6% of patients suffered from anxiety, while 23.6% of patients suffered from depression.
A2	<i>Effectiveness of cognitive-behavioral therapy (CBT) in improving the quality of life and psychological fatigue in women with polycystic ovarian syndrome: a randomized</i>	Iran	To determine the effect of therapy behavior cognitive (CBT) on quality of life and psychological fatigue of women with PCOS.	Quantitative : Randomized Controlled Trial (RCT)	Questionnaire: respondents were selected by purposive sampling based on the Rotterdam criteria and their confirmation that they had two of the three PCOS diagnostic criteria. Then, they filled out the pretest questionnaire and were	74 women diagnosed with PCOS and aged 18-35 were sampled in this study using a purposive sampling technique.	The study revealed that CBT was capable of reducing fatigue and enhancing the quality of life of the sampled woman with PCOS, which thus improved their health status.

	<i>controlled clinical trial</i> (Abdollahi et al., 2019)				directed randomly to the control group and the counseling group.		
A3	<i>Prevalence of anxiety and depression among women with Polycystic Ovary Syndrome living in war versus non-war zone countries: A randomized controlled trial assessing a pharmacist intervention</i>  (Alkoudsi & Basheti, 2020)	Jordan	To investigate the prevalence of anxiety/depression among women diagnosed with PCOS living in Syria (war zone countries) and Jordan (non-war zone countries), and evaluate the impact of pharmaceutical services provided by clinical pharmacists on the severity of participants' anxiety/depression	Quantitative : Randomized Controlled Trial (RCT)	Questionnaire: women diagnosed with PCOS were randomly selected and identified by prescription by recruiting pharmacists of the registered community pharmacies. Women with PCOS were verified and invited to participate in the study. Participants belonging to the active group received standard pharmacist counseling as regulated by the research group.	Women living in Syria and Jordan were diagnosed with PCOS based on prescription drugs at registered community pharmacies. The sample consisted of 118 respondents. 60 respondents were from Syria and 58 respondents were from Jordan.	This study revealed that the prevalence of anxiety or depression in PCOS women was higher in both countries as compared to women without PCOS. In addition, women who received PCOS pharmaceutical care services showed significant improvements in their anxiety or depression scores.
A4	<i>Impact of polycystic ovary syndrome on eating behavior, depression and health related quality of life: A cross-sectional study in Riyadh</i>	Saudi Arabia	To explain the relationship between polycystic ovary syndrome (PCOS) with eating disorders, in particular, BED	Quantitative : Cross-sectional	Questionnaire: respondents filled out a survey questionnaire and provided further information through face-to-face interviews. Afterward, they filled out the validated Arabic	494 samples were divided into two groups: 116 cases and 378 controls group. The sample size was calculated based on the population size in Riyadh	Women with PCOS had a significant risk for depressive disorders, disordered eating behavior, and impaired quality of life.

	(Asdaq et al., 2020)		and depression as well as to determine the impact of these features on the quality of life		version of the DASS-21 questionnaire.	in the age group of 0-54 years old.	
A5	<i>Association among depression, symptom experience, and quality of life in polycystic ovary syndrome</i>  (Greenwood et al., 2018)	United States	To examine the association between depression and health-related quality of life (QOL) in polycystic ovary syndrome (PCOS).	Quantitative : Cohort	Questionnaire: secondary data analysis from RCT, respondents filled out an informed consent to participate in this study. Respondents who completed the PCOS Questionnaire (PCOSQ) and the Mental Disorders Primary Care Evaluation (PRIME-MD) Patient Health Questionnaire (PHQ) at the screening visit were included in the analysis.	Respondents were 18-40 years old and diagnosed with PCOS based on the modified Rotterdam criteria. 732 samples were enrolled in the Pregnancy in Polycystic Ovary Syndrome II clinical trial at 1 of 11 health centers. Data were analyzed using linear regression to determine the relationship between depression and PCOSQ.	Depressed women were reported to have a decreased quality of life in all domains compared to non-depressed women.
A6	<i>Risk of psychological burden in polycystic ovary syndrome: A case control study in Riyadh, Saudi Arabia</i>  (Asdaq & Yasmin, 2020)	Saudi Arabia	To investigate whether mental health and sexual function differ between women with and without PCOS with comparable BMI and fertility characteristics	Quantitative: A case-control	Questionnaire: the use of convenience sampling method in recruiting PCOS cases and the application of simple random sampling technique for recruiting control participants.	Respondents in this study were based on the age group of 18-50 years and diagnosed with PCOS with the Rotterdam criteria. 167 samples were divided into two groups. 82 samples were in the case group and 85	Most patients with PCOS cases experienced a higher level of stress, depression, and anxiety as compared to that of the control group and the global quality of life score of depressed

						others were in the control group.	women was reduced significantly.
A7	<p><i>Psychological Experiences of Adolescent Girls with Polycystic Ovary Syndrome</i></p> <p>(Ekramzadeh et al., 2020)</p>	Iran	To investigate the psychological experience of adolescent girls with PCOS	Qualitative with a phenomenological approach	In-depth interviews, focus groups, and field notes. This study used a content analysis method, in which participants were recruited directly based on the inclusion and exclusion criteria. The subject's telephone numbers were recorded for a further phone interview.	Participants in this study were adolescents aged 15-21 years and health workers (two midwives, six gynecologists, two endocrinologists, and five nutritionists), participants were recruited directly. The samples in this study were 18 young women with PCOS and 15 health workers. Samples were selected using a purposive sampling technique.	This study reported that Young women with PCOS were faced with various concerns that harmed their psychological health.
A8	<p><i>Pioglitazone Metformin Complex Improves Polycystic Ovary Syndrome Comorbid Psychological Distress via Inhibiting NLRP3 Inflammasome Activation: A Prospective Clinical</i></p>	China	To investigate the effect of Therapeutic and PM mechanisms on psychological stress of PCOS comorbidities.	Quantitative: observational using a prospective/cohort approach	Questionnaire: participants who came to the outpatient clinic of Changhai Hospital for the period October 2016 – July 2018 were considered to be included in the study by taking into account the inclusion and exclusion criteria.	Respondents in this study were aged 20-35 years, who met the diagnostic criteria for PCOS Rotterdam, and who met the diagnostic criteria for psychological distress. 75 respondents were taken as samples. Afterward, participants with PCOS and psychological comorbidity were randomized and divided	This study revealed that Pioglitazone Metformin (PM) reduced psychological distress through inhibition of the NLRP3 inflammasome and increased several markers, including total testosterone because PM is superior to metformin in reducing total testosterone.

	<i>Study ( Guo, Shan, Xu, et al., 2020)</i>					into 3 treatment groups, namely the placebo group, metformin, and metformin pioglitazone. The samples were selected using random sampling.	
A9	<i>Sleep Disruption and Depression, Stress and Anxiety Levels in Women with Polycystic Ovary Syndrome (PCOS) During the Lockdown Measures for COVID-19 in the UK</i>  (Kite et al., 2021)	United Kingdom, England	To determine potential problems such as negative effects on sleep quality in women with PCOS in the United Kingdom (UK), and associated decreased quality of life and improved sleep quality, stress, anxiety, or depression in women with	Quantitative: Cross-sectional	Questionnaire: Recruitment was carried out through social media and with support from Verity (UK PCOS charity) and the PCOS support group on Facebook. Questionnaires were distributed and completed online using survey software: Qualtrics XM (Qualtrics XM, Provo, Utah, USA), in which participants expressed their interest in participating in the study	The respondents studied were women with a medical diagnosis of PCOS, aged 18-45 years, and living in the UK. 333 respondents were classified based on their responses regarding the impact of COVID-19 restrictions. The group indicating that the pandemic had a negative impact to 242 respondents, while the remaining 91 indicated that the pandemic has	This study proved that the majority of British women with PCOS in the study group felt that the measures implemented in response to the COVID-19 pandemic had a negative impact on their sleep quality, with a high prevalence of insomnia. There was also evidence that women with PCOS and sleep disorders had greater risks of having
			PCOS for the COVID-19 pandemic in the UK.		and the URL link of the survey was emailed to them directly. Alternatively, participants could access the questionnaire directly via the same study URL posted on social media	contributed to positive impacts on them.	psychological morbidity (eg, depression/stress) and decreased quality of life.

					channels. The study URL link contains the initial participant information sheet, as well as the grant of consent.		
A10	<i>Mental and personality disorders in infertility women with polycystic ovaries: a case-control study</i>  (Ahmadi et al., 2020)	Iran	To investigate mental and personality disorders in infertile women with and without PCOS.	Quantitative: Cross-sectional	Questionnaire: participants with PCOS were firstly recruited based on the diagnostic criteria of Rotterdam 2003 before they were provided with information about the purpose of the study. Then, they were required	Respondents with PCOS aged 15-50 years old were 400 respondents, most of whom were infertile women. 201 respondents with PCOS were categorized in the case group and 199	Average scores for multiple mental and personality disorders were higher in infertile women with PCOS. The six personality disorders were schizoid, avoidant,
					to indicate their informed consent. The next step was enrolling the participants in the interview by doctors for 30 minutes to obtain the necessary demographic or medical information. Afterward, the patients were provided with the Million Clinical Multi-axial Inventory-III (MC-MI-III) questionnaire for psychological disorders.	respondents were classified into the control group. The samples were selected using convenience sampling.	dissocial, depressed, sadistic, and negative.

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## RESULTS

The data charting generated 10 international articles based on the database. On this basis, the researchers made the following research characteristics:

### 1. Study Characteristics by Country

10 articles were obtained during the search. These articles were written based on researchers carried out in several countries throughout Asia, America, and Europe. 8 articles were conducted in Asia (2 articles were from China, 3 articles were from Iran, 2 articles were from Saudi Arabia, 1 article was from Turkey, and 1 article was from Jordan). Only one research article was written based on research conducted in Europe, particularly in England, and only 1 article was written based on research in the United States.

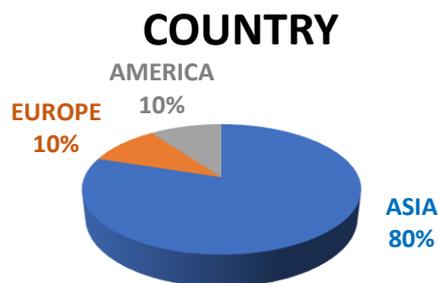


Figure 2. Study Analysis by Country

### 2. Characteristics by article type

The 10 selected articles consisted of 1 qualitative study, 4 cross-sectional studies, 2 RCTs, 2 cohorts, and 1 case-control.

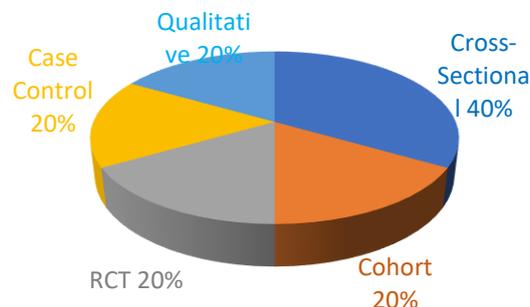


Figure 3. Study Analysis by types of article

### 3. Characteristics by theme

Based on the 10 articles obtained, the researchers then determined 3 themes by creating a theme mapping. The 3 themes in the mapping are the determinant factors, the effectiveness of therapy, and the mental health impact of women with PCOS. The mapping was explained by the researchers through the following table:

Table 3. Analysis of articles by theme

<b>NO.</b>	<b>THEME</b>	<b>ARTICLE</b>
1.	PCOS determinants	A5, A6, A7, A10
	a. Infertility	A5, A6, A10
	b. Menstrual Disorder	A6, A7, A10
	c. Pimple	A6, A7
	d. Obesity	A7
2.	Effectiveness of PCOS therapy	A2, A8
	a. CBT	A2
	b. Pioglitazone Metformin (PM)	A8
3.	PCOS Impact	A1, A3, A4, A6, A7, A9, A10
	a. Physique	A4
	b. Social	A6
	c. Psychology	A3, A6, A7, A10
	d. Sleep quality	A1, A9

From these themes, articles that discussed the determinants of PCOS were articles 5, 6, 7, and 10. In particular, articles 5 and 10 addressed infertility and the indicated that infertility has generated a lower score on quality of life and a higher mental disorder score in infertile women with PCOS. Articles 6 and 7, which discussed all of the sub-themes under theme one except obesity, revealed that the majority of PCOS women experienced infertility, menstrual disorders, and acne.

In addition, the second theme, which discussed the effectiveness of therapy, was found in articles 2 and 8. Article 2 particularly addressed CBT therapy which disclosed that CBT was able to reduce fatigue and improve the quality of life in PCOS women. Article 8 explained that PM reduces psychological distress and improves the quality of life in women with PCOS.

Meanwhile, the third theme on the impact was described in articles 1, 3, 4, 6, 7, 9, and 10. To be precise, article 4 described the physical aspect that produces oligomenorrhea-hirsutism which was very influential in terms of physical function, the role of physical aspects, pain, emotional role functioning, and emotional well-being because it was related to the menstrual cycle, which was an influencing factor on women's quality of life. On the other hand, articles 3, 6, 7, and 10 shared discussions about social and psychological results. These articles particularly indicated that PCOS patients were estimated to experience social, psychological and family pressures. The last two articles, 1 and 9, discussed sleep quality which resulted in psychological disturbances that would lead to a

decreasing quality of life, which could exacerbate the condition and quality of sleep in women with PCOS.

## **DISCUSSION**

### **Determinants of Mental Health of Women with PCOS**

Infertility, menstrual disorders, obesity, and acne are among the causes of PCOS. Infertile women will experience PCOS, which makes it difficult to get pregnant. This condition is because women with PCOS experience menstrual disorders due to imbalanced hormones (LI et al., 2017). PCOS is also often characterized by acne and obesity. Imbalanced hormonal changes or hormone imbalance is one of the causes of PCOS which can lead to menstrual disorders, stress, and emotional disturbances. PCOS often occurs in women who experience excessive weight gain, and somatic symptoms, such as obesity and hirsutism, which are associated with the risk of depression (Borghi et al., 2018).

This is in accordance with research (Karsten et al., 2021) which explained that clinical features of PCOS such as acne, hirsutism, obesity, and infertility could cause emotional distress, thereby reducing mental health and sexual function. Obesity and infertility are also major limitations of anxiety and depression.

### **Therapy Effectiveness of Mental Health of Women with PCOS**

The Pioglitazone Metformin (PM) provision in women with comorbid psychological stress PCOS is proven to be effective. Women suffering from PCOS mostly expressed symptoms of anxiety and depression. Pioglitazone administration can be an option for the treatment of depression due to its anti-inflammatory properties (Munn et al., 2018b). The combination of metformin and pioglitazone is recommended for PCOS patients because PM shows much better results than the provision of metformin alone. PM is more effective than metformin for lowering testosterone levels, but not for anxiety and depression (Guo, Shan, Hu, et al., 2020).

Therefore, it is necessary to carry out additional appropriate therapy as written in article 2. The cognitive-behavioral therapy (CBT) technique showed that the average quality of life score in women with PCOS given CBT therapy was 60.2%, which was greater than the results of women with PCOS who were not provided with the therapy as indicated by the CBT score of 24.4%. It was conclusive that women with PCOS were a group at risk for psychological disorders and decreased quality of life (Rosenfield, 2015b). This fact was described in a study by Evertsz et al. (2017), which revealed the effectiveness of CBT in improving mental health in women with PCOS, improving quality of life, and reducing anxiety and depression. Pharmaceutical care services provided to women with PCOS experienced a significant increase in anxiety and depression scores; the longer the intervention, the greater the improvement in anxiety and depression outcomes. Thus, it is clear that the provision of medication to PCOS patients with psychological disorders is far from sufficient, and that additional therapy is needed in this case to generate appropriate and significant results.

### **Mental Health Impact of Women with PCOS**

The oligomenorrhea-hirsutism has a highly influential impact on physical function, physical role, pain, emotional role function, and emotional well-being

because it is related to the menstrual cycle that serves as a factor that affects the quality of life of women (Meaney et al., 2021). Irregular menstrual cycle as a factor in infertility or hirsutism has caused stress and worsened ovulation disorders. Disturbances in poor quality of life due to irregular eating and disturbances in sleep quality are caused by stress arising from disorders of the ovules. (Açmaz et al., 2013) stated that there was no difference in terms of depression between women with PCOS and non-PCOS patients, but there was an increase in anxiety in PCOS patients. The poor quality of life could increase the risk of eating disorder (BED) in women with PCOS as compared to women without PCOS. Patients with BED were also at risk for obesity. PCOS patients had a significant chance of developing BED and depression (Zisapel, 2018). Losing weight is far from easy, especially in women who experience BED and depression during PCOS.

PCOS patients were thought to experience social and family pressure as described in the study of Ahmadi et al. (2020), which mentioned six personality disorders: schizoid, avoidant, antisocial, depressed, sadistic, and negativistic. It has been explained that unwanted hair growth could lead to social avoidance and feelings of self-consciousness, which was detrimental to mental health and social behavior (de Onis et al., 2013). Research (Moyer et al., 2020) showed that acne had a negative correlation with the mental health status of infertile patients with PCOS. Obesity, acne, and hirsutism were also stated as independent predictors of dissatisfaction with self-image. Acne was one of the factors that affected mental health, and it was also one of the most important clinical features of PCOS and the most common signs of hyperandrogenism. This had an impact on the psychological disorders of women with PCOS, who were more prone to depression compared to men, let alone the presence of gynecological problems that worked as depression simulators. This statement is in accordance with research (Kitesa et al., 2016), that women of childbearing age, especially adolescent girls with PCOS were faced with many concerns that could endanger their psychological health. Most cases of PCOS experience stress, depression, and anxiety, and such psychological disorders would certainly decrease the quality of life since they could interfere with the condition and quality of sleep. Sleep status was generally closely related to melatonin secretion, which was a physiological regulation of sleep. According to (Shabani et al., 2019b), melatonin supplementation, sleep quality, and anxiety/depression status of patients with PCOS improved. The majority of women with PCOS in the UK had poor sleep quality, especially during the Covid-19 pandemic, which also showed a decline in quality of life. The lockdown situation during the Covid -19 pandemic resulted in a negative impact on the sleep quality of women with PCOS, which was associated with an increase in depression or higher stress. The odds were high that the Covid-19 pandemic has made things worse. There was a need for a new focus from health workers to ensure adequate support and provision of care to prevent and reduce further comorbidities. Depressed women had a reduced quality of life compared to women who were not depressed.

## **LIMITATIONS**

The limitations of this study are the number of articles that do not mention the confounding factors and the way to control them. In addition, too many articles

on the effect of drug therapy were also found in this case, which thus has limited the selection of journal articles that are in accordance with the topic of the review of mental health in women with PCOS.

## CONCLUSION

Following the purpose of the study to determine the mental health of women with PCOS, it is clear that women with PCOS have suffered from psychological disorders, especially at the level of anxiety. Hence, there is a correlation between mental health and PCOS, which results in a decrease in quality of life due to stress/depression, increased anxiety, and poor sleep quality. Pioglitazone Metformin (PM) is not a sufficient treatment for these cases. Additional help with additional therapies, such as counseling and cognitive-behavioral therapy (CBT) is also needed to cure the problem. Women with PCOS are at risk for psychological disorders, especially when they have a lower quality of life as compared to women without PCOS. Therefore, the government needs to pay more attention and there should be better cooperation between health workers, especially midwives, obstetricians, psychologists, and psychiatrists in handling these cases. Furthermore, it is also suggested that the next review select more articles from various languages.

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