A descriptive literature review: Investigating the connection between polycystic ovary syndrome and mental health issues

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Polycystic ovary syndrome (PCOS) is a hormonal disorder affecting women of reproductive age. The common symptoms include e.g. hormonal imbalances, weight gain, excessive hair growth, acne and abnormal menstruation. PCOS is a chronic condition which means there is no cure. Recently more and more women diagnosed have figured, that even though there is no cure, the symptoms are rather reversible e.g. with lifestyle changes. Since PCOS is such a complex disorder, it affects women's mental health as well.

The purpose of this study was to explore the connection between PCOS and mental health issues with the aim of developing new information for nurses to use and anyone interested in the topic. Since PCOS is causing women to suffer from physical symptoms as well as psychological, it is crucial that nurses are informed of the condition and have the competences to care women with it. This study was conducted as a literature review where studies from 2013-2023 from academic databases were used. The results revealed that women with PCOS indeed have an increased risk of mental health issues such as anxiety and depression.

Contents

1   INTRODUCTION

Polycystic ovary syndrome also known as PCOS is a chronic endocrinological condition and one of the most common and complex disorders affecting women amongst the reproductive age all over the world (WHO 2023; McGowan 2011; Ismayilova & Yaya 2023). The disorder is often overlooked in patients because of the lack of information in health care services (Ismayilova & Yaya 2023). Even more overlooked is the mental health problems most of the women suffer from on top of all the physical symptoms (Ismayilova & Yaya 2023). Nurses and other healthcare professionals often engage patients with PCOS but may not be adequately prepared to address the possible mental health aspects of this disorder because of the lack of education around the topic. A survey conducted by Dokras et al. (2017) identify, that a large percentage of physicians responded in the survey did not know e.g. the current criteria for diagnosing PCOS. Another study interviewed women with PCOS aiming to identify women's experience of receiving information about PCOS. The answers from the women interviewed included experiences about healthcare professionals' lack of knowledge and conflicting information (Tomlinson et al. 2013).

WHO (2023) Has stated PCOS being a significant public health problem. Approximately 8-13% of fertile women are affected by it and even 70% of the cases stays undiagnosed WHO (2023). Therefore, studying about this topic and educating nurses is extremely important.

PCOS untreated can lead to serious physical and psychological complications. According to Lizneva et al. (2016) Many women with the condition are e.g. insulin resistant, have increased risk of type 2 diabetes and coronary heart disease. Thus, leaving PCOS undiagnosed can lead to even further complications. Leaving women alone to battle with the condition and its symptoms can expose them to feeling unsatisfied (Ismayilova & Yaya 2022). This can take a serious toll on one's mental health, on top of all the physical symptoms.

For women with PCOS to receive holistic care it is crucial for nurses to be able to identify symptoms of the condition. The nurse – patient relationship plays an important role before and after the diagnosis. Nurses' key competences include patient education in all aspects; physical, psychological and social. They can help patients with medication management or guide with nutritional changes. They can give coping skills for anxiety to support psychological health and to manage the quality of social life. Another very important role nurses have is to work as an advocate for raising awareness.

2   THEORETICAL BACKGROUND

2.1   Polycystic ovary syndrome

Polycystic ovary syndrome (PCOS) is a chronic condition where women of reproductive age experience symptoms coming from the imbalance of their hormones. According to WHO (2023) up to 70% of women with PCOS often stay undiagnosed worldwide, which can tell about the complexity and ignorance around the condition. Women with PCOS often struggle with low quality of life because of the complex symptoms affecting them physically, psychologically and socially.

2.1.1   Diagnosis

The diagnostics of PCOS has evolved significantly since it was first characterized in 1935 by Stein and Leventhal as referred in the article by Christ and Cedars (2023). In 1990 National Institutes of Health Criteria (NIH) suggested a criteria, where there has to be the prevalence of clinical and/or biochemical hyperandrogenism and oligo-anovulation (Zawadski § Dunaif 1992, cited in Mohammad & Seghinsara 2017). Later on, in 2003, the Rotterdam criteria was proposed by 27 expertizing in PCOS. They suggested adding polycystic-appearing ovarian morphology criteria, which then increased the amount of diagnoses to be three times more compared to the 1990 NIH (Christ & Cedars 2023).
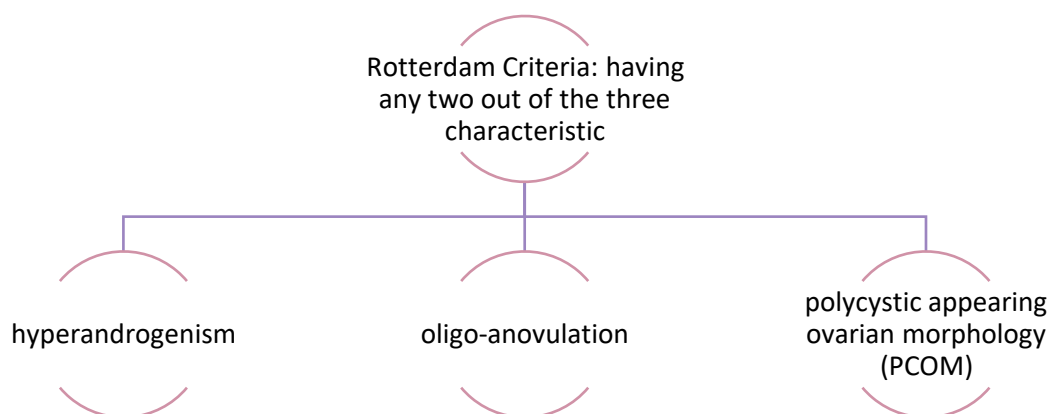

Figure 1: Rotterdam criteria (2003) for diagnosing PCOS

Since the Rotterdam criteria, Androgen Excess Society (AES) wanted to put more focus on hyperandrogenism when diagnosing PCOS (Christ & Cedars 2023) and came up with a new guideline.

The AES guideline:
required prevalance

hirsutism and/or
biochemical
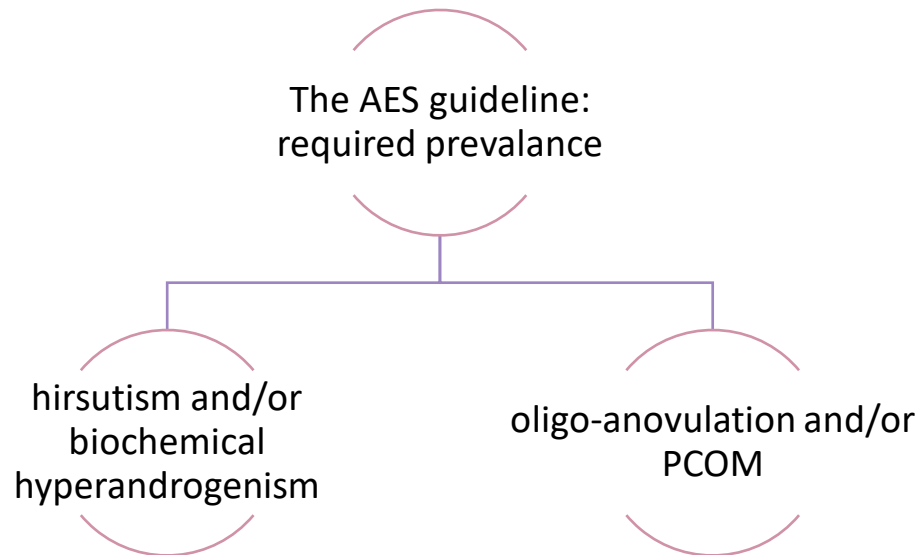hyperandrogenism

oligo-anovulation and/or
PCOM

Figure 2: The AES guideline (2006) for diagnosing PCOS

The most recent recommendation published in 2023 by Christ and Cedars is, that the Rotterdam criteria is the most relevant and should be used, when diagnosing PCOS.

2.1.2   Symptoms

Women with PCOS can experience a variety of symptoms. According to NHS (2022) not all women have all of the symptoms and the severeness may vary. Johns Hopkins Medicine (2022) has listed symptoms women with PCOS may have; menstrual irregularities, obesity, cysts in ovaries (PCOM), unwanted body hair especially in the "male-pattern" area e.g. abdomen and face (hirsutism), acne and infertility.

2.1.3   Risk factors

Singh et al. (2023) list several factors that could be associated with the disorder; polluted environment, diet and lifestyle, genetics, obesity and microbe imbalance of the gut. WHO

(2022) states, that PCOS is more common amongst some ethnic groups. NICHD (2022) list several conditions associated with PCOS:
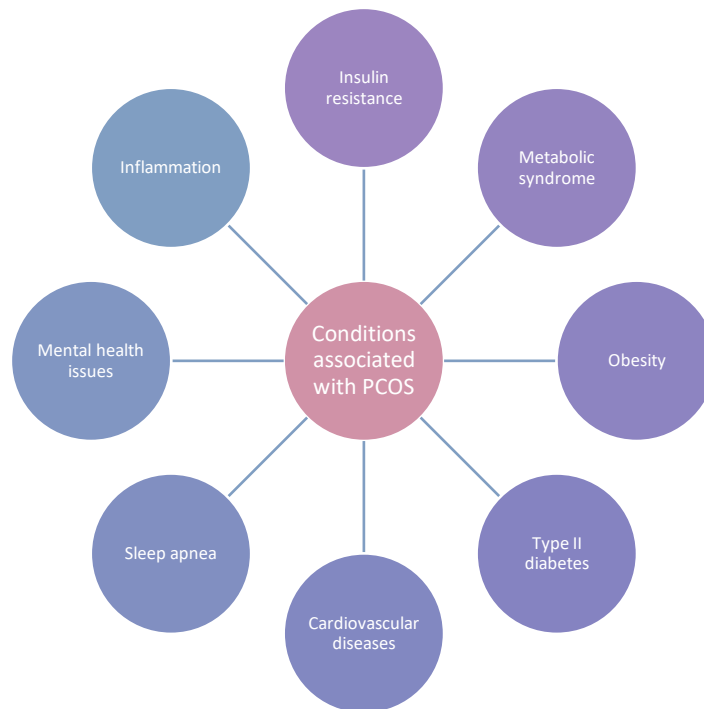

Figure 3: Health conditions that women with PCOS are at higher risk for according to NICHD (2022).

Pregnant women with PCOS have a minor risk of miscarriages and the risk of gestational diabetes is also increased (Tiitinen 2022).

2.1.4   Treatment

There is no cure for PCOS, thus symptom management or reversing them is the main goal. Depending on the patient's status of lifestyle and pregnancy goals, the treatment should be individualized (Williams, Mortada & Porter 2016). If the patient is obese the first line treatment should be weight management - a healthy diet and more physical activity (John Hopkins Medicine 2023; NHS 2022). According to NHS (2022) losing weight of only 5% can relieve the symptoms and decrease the risk of developing prolonged health problems. Another path of symptom management is medicine. Depending on the symptoms wished to be managed, different options may be chosen:
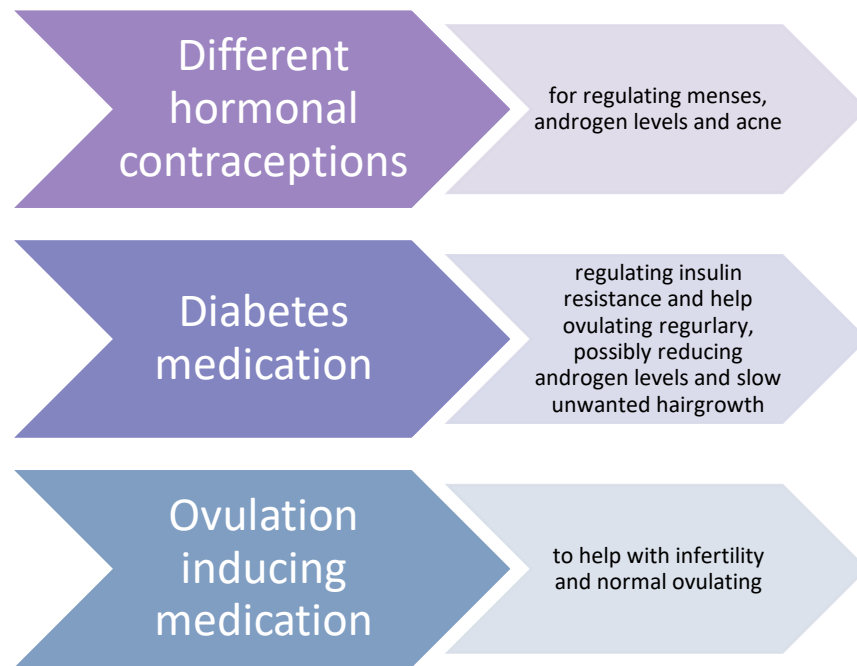
Different hormonal contraceptions	for regulating menses, androgen levels and acne
Diabetes medication	regulating insulin resistance and help ovulating regurlary, possibly reducing androgen levels and slow unwanted hairgrowth
Ovulation inducing medication	to help with infertility and normal ovulating

Figure 4: Medication options for PCOS symptom management (John Hopkins Medicine 2023; NHS 2022).

2.2 Mental health

According to WHO (2022) "Mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community". Everyone's mental health and strengths of it are different – some can cope with hardships easy and others not. For the sake of ones' well-being, mental health is an important resource (Mieli 2021). If one's mental health status is unstable it can play as a risk factor for developing mental illness' e.g. depression or schizophrenia. Unstable mental health can be caused by trauma, genetics, substance abuse and feeling of loneliness (CDC 2023a). Nurses recognizing patients' mental health status is important for patients to receive the proper care they need. Many nurses are experienced in the psychiatric nursing field and have advanced abilities to assess and treat the ones who need it.

2.2.1 Physical

Mental health is important for one's physical health. Unstable mental health can lead to mental health conditions e.g. depression, which can increase the risk of physical health problems (CDC 2023a). According to CMHA (2023) mental health and physical health are connected. CMHA (2023) also states, that mental health is connected to chronic illnesses,

that can have an effect on one's quality of life. Chronic illnesses e.g. cardiovascular diseases or diabetes may be affecting in the development of mental health issues (NIMH 2021).

2.2.2 Emotional

Emotional health is one of the aspects of mental health (NIMH 2022). Your emotional skills are the base of good mental health (YTHS 2023b). According to familydoctor.org (2023) these skills include good control of thoughts, feelings and behaviors. Signs of someone struggling with emotional health can include e.g. increased substance abuse, isolating from friends and family, loss of energy and eating or sleeping too much or too little (SAMHSA 2023).

2.2.3 Social

Feeling of connection and community is a steam of ones' social health (Killam 2023). Social health is when one has relationships e.g. family and friends and feels belonged, supported, valued and loved by them (CDC 2023b). When times get rough or one has something to celebrate about, social relationships can play a powerful resource allowing to experience them with others (YTHS 2023a). According to YTHSa (2023), the development of social skills starts from a young age - others are more outgoing and extroverted and others need more time to feel comfortable around new people and are more introverted. These patterns come from childhood and the environment one grew up in – the more positive experiences of social relationships you had the easier it is to develop them in the future (YTHS 2023a). Feeling of loneliness comes from the lack of social relationships. This doesn't necessarily mean being alone – just feeling like you don't belong. The feeling of loneliness has a huge impact on mental health and can later on expose to mental illnesses (Mushtaq, Shoib, Shah & Mushtaq 2014).

3 THE PURPOSE, AIM AND RESEARCH QUESTION

The purpose of this literature review is to find out the connection between mental health issues and PCOS, which is often overlooked in patients. The aim is to develop information for nurses, nursing students and other health care professionals to use when treating women based on previously published studies. The question this thesis provides an answer to is "How PCOS affects women's mental health?"

4   METHODOLOGY

4.1   Literature review as a research method

Literature review is when academic literature of a specific topic is critically evaluated and then written in a demonstrative and understanding way of the topic in a form of a review (IAD, Univeristy of Edinburhg 2023). According to Charles Sturt University (2023), there are four most common types of literature reviews: Narrative-, rapid-, scoping and systematic review. This thesis was produced as a descriptive literature review.

4.2   Data retrieval

To get the most current and effective information the selected articles are from databases provided in Laurea's electronic library guides such as PubMed, EBSCOhost, ProQuest Central and Google Scholar. The selected articles are all in English and from 2013-2023. The target group is all women, no age or regional restrictions since the goal was to gather overall information about the topic. Data retrieval was done using the inclusion – exclusion criteria found in table 1 and keywords in table 2.

Table 1: Inclusion - Exclusion criteria

Inclusion criteria	Exclusion criteria
Articles from 2013-2023	Articles written before 2013
Articles accessible free of cost or through Laurea SFX	Articles requiring purchasing
Full text available	Full text not available
Articles with keywords	Articles not matching the keywords
Articles in English	Language some other than English
Theoretical studies/peer reviewed about the topic	Non-theoretical studies or not peer reviewed

Table 2: Search results

Database	Keywords	Number of search results	Chosen by the title	The final choice
EBSCOhost CINAHL	Polycystic ovary syndrome AND mental health	5	2	0
	Polycystic ovary syndrome AND Depression OR Anxiety	89	7	4
ProQuest Central	Polycystic ovary syndrome AND mental health	56	7	1
	Polycystic ovary syndrome AND depression OR anxiety	129	6	0
ScienceDirect	Polycystic ovary syndrome AND mental health	60	7	5
PubMed	Polycystic ovary syndrome AND mental health	26	0	0

4.3   Content analysis

The analysis of the found data is an important part of literature review. According to Columbia University Mailman School of Public Health (2023), there are two ways of approaching a content analysis: conceptual and relational. After intensive data retrieval using different keywords, and inclusion - exclusion criteria in table 2, 30 studies were chosen by the title. These studies were then printed out if possible. Analyzing the pre-content was done by eyeing and reading them multiple times, and using highlighter pens, to point out the main themes. Afterwards, notes were taken, and the careful final choice was made. The final choice of the studies can be found in appendix 1. Analyzing the final chosen data was done by using the inductive content analysis method. Inductive analysis method is done when the goal is to develop a theory by studying the documents and identifying the themes of them (CHRON 2021). After indicating the subthemes found in figure 5, main themes were listed which can be found in figure 6.
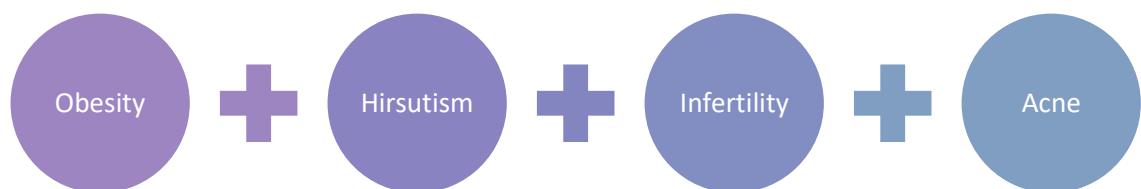
Obesity   Hirsutism   Infertility   Acne
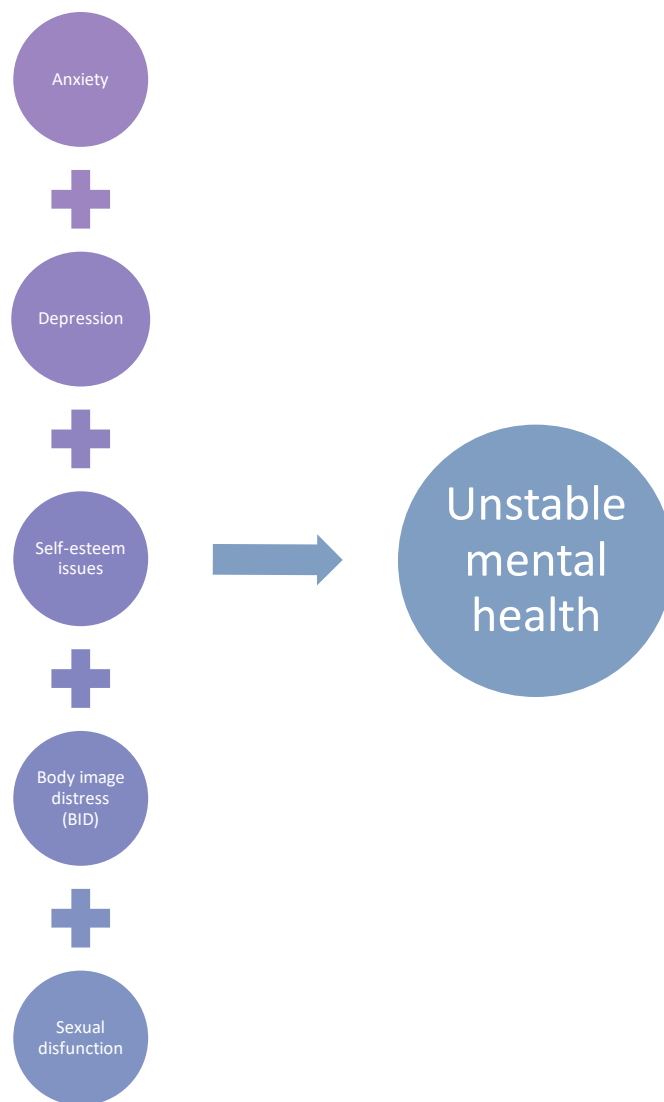
Figure 5: Content analysis subthemes

Figure 6: Content analysis main themes

5 RESULTS

After intense studying of the chosen literature, these studies show that women with PCOS are at higher risk for mental health issues (Annagür, Tazegül & Akbaba 2014; Cesta et al. 2016; Syed & Farhana 2020). Exploring the results follow the five main themes found by the author in content analysis part. Studies indicate that especially the risk of depression and anxiety is increased (Pawel et al. 2022; Hung et al. 2014). Study conducted In Saudi Arabia by Syed and Farhana (2020) show that 69,5% of women with PCOS involved in the study had depression, 65,9% had anxiety and 85,4% had significant stress. In the same study, the control group's depression percentage was reported to be 47,1%, anxiety 45,9% and stress 38,8% (Syed &

Farhana 2020). Cesta et al. (2016) study also discovers, that the risk of depression and anxiety is significantly increased. The same study also indicates, that the risk of psychiatric disorders like bulimia, schizophrenia and bipolar disorder are increased (Cesta et al. 2016). Then again, study by Hung et al. (2014). suggests differently: the risk of schizophrenia and bipolar disorder was not significantly increased.

Furthermore, Annagür et al. (2014) and Bazarganipour et al. (2013) state, that women's self-esteem and body satisfaction is affected by all these complex symptoms. Syed and Farhana's study (2020) states, that there is a significant link with hirsutism, depression, anxiety and stress. They indicate hirsutism having an effect on social avoidance and feeling self-conscious (Syed & Farhana 2020). They also state, that due to symptomology of PCOS e.g. hyperandrogenism affecting physical appearance, women experience more stress. This can conduct in women of developing depression and anxiety (Syed & Farhana 2020).

Study conducted by Bazarganipour et al. (2013) show, that infertile women with PCOS had decreased levels of self-esteem and body satisfaction when comparing to women with PCOS who were not infertile. According to Bazarganipour et al. (2013) irregular menstruation and infertility can have a decreasing effect of feminine identity of women with PCOS. Study by Kogure et al. (2019) show, that women who were normal, overweight and obese by BMI all experienced body dissatisfaction and body image distress (BID). Alur-Gupta et al. (2019) study also indicates, that women with PCOS had higher scores when evaluating BID. Kogure et al. (2019) suggest, that there could be a link between body dissatisfaction, sexual disfunction and depression. Kogure et al. (2019), refers to a study conducted by Ferraresi et al. in 2013, where obesity is considered as a risk factor for sexual disfunction. Kogure et al. (2019) indicates, that 54,1% women conducted in their study, met the criteria for sexual disfunction and that depression is a risk factor for sexual disfunction. 62,9% of women with PCOS involved in the study had depression and sexual disfunction (Kogure et al. 2019).

Asik et al. (2015) and Cesta, Kuja-Halkola, Lehto, Iliadou and Landén (2017) both study the psychiatric markers that can help in predicting and identifying the risk for depression. Cesta et al. (2017) study the personality trait neuroticism and Asik et al (2015) the affective temperament features. Women with PCOS neuroticism scores were higher compared to the control group (Cesta et al. (2017) and in Asik et al. (2015) study, the temperament subtype scores were significantly higher.

6   DISCUSSION

To ensure trustworthiness of this study, only peer reviewed articles and reliable databases were used e.g. World Health Organization, PubMed and CINAHL. When searching for research

articles regarding to the topic, the inclusion – exclusion criteria were strictly followed. The producing of the thesis was done by one author which can affect the objectivity of the findings.

Validity and reliability were a subject that was thought about already in the planning phase of the thesis. The subject of the thesis did change a few times because of this matter. After final careful consideration, the author came up with the topic chosen, because she felt that there was not enough valuable and reliable information for nurses to use.

The rectors' conference of Finnish universities of applied sciences (ARENE) has produced ethical recommendations for thesis writing. They state, that the guidelines they have made can be modified within every UAS (ARENE 2019). This thesis was done by following the guidance of laurea's guidelines for research and referencing. The referencing guidelines were strictly followed to ensure validity and that no intentional plagiarism is done. The used studies did not include any personal information of the women and all of the authors had concluded ethical considerations in their work. Thus, only respectful studies were used. ARENE (2019) also states about medical research act, where e.g. the interest and well-being of the individuals studied must be prioritized. Since this thesis was done as a literature review, there was no straight connections to individual's personal data. Therefore, ensuring well-being or data protection regarding individuals was not something that had to be carefully considered by the author.

According to TENK (2023) the cornerstones of research integrity are: "reliability, honesty, respect and accountability", which principles this thesis has followed during the implementation phase.

ARENE (2019) has made a 13-part checklist for checking the ethical guidelines of the done work. These include e.g.: acquaintance of the chosen thesis topic and ethical research guidelines (ARENE 2019). This thesis has followed the checklist and every part hold true.

This thesis was conducted as a descriptive literature review by exploring the connection between mental health issues and PCOS and what effects it can have on women. All the articles were carefully retrieved from 2013 to 2023 and used the inclusion – exclusion criteria set beforehand. There were no specific race or ethnicity criteria set, since the goal was to find overall information on this overlooked topic. However, as searching for studies to use, the same pattern kept repeating; it seemed like majority of these studies were conducted in Arabic/Asian countries such as Saudi Arabia, Oman, Iran, Pakistan and especially Türkiye. This could indicate that there is a connection with people of color (POC) and PCOS, which could use some further investigation. WHO (2023) states that PCOS is more common among some ethnicities, but don't specify this further. The studies investigated show, in how many different ways women's mental health is affected by the complex symptoms. The main

themes found were women experiencing mental health issues such as depression and anxiety, BID, self-esteem issues and sexual disfunction. PCOS as a condition is very complex and every woman should be provided with individualized treatment plan and get the care they have the right for, including mental health aspects.

References

Alur-Gupta, S., Chemerinski, A., Liu, C., Lipson, J., Allison, K., Sammel, M-D. & Dokras, A. 2019. Body-image distress is increased in women with polycystic ovary syndrome and mediates depression and anxiety. Fertility and sterility. 112(5), 930-938. Doi: https://doi.org/10.1016/j.fertnstert.2019.06.018

Annagür, B-B., Tazegül, A. & Akbaba, N. 2014. Body Image, Self-Esteem and Depressive symptomatology in Women with Polycystic ovary syndrome. Noro Psikiyatr Ars. 51(2), 129-132. Doi: 10.4274/npa.y6778

ARENE. 2019. Ethical recommendations for thesis writing at universities of applied sciences. Accessed 30.11.2023. https://www.arene.fi/wp-content/uploads/Raportit/2020/ETHICAL%20RECOMMENDATIONS%20FOR%20THESIS%20WRITING%20AT%20UNIVERSITIES%20OF%20APPLIED%20SCIENCES_2020.pdf?_t=1578480382

Asik, M., Altinbas, K., Eroglu, M., Karaahmet, E., Erbag, G., Ertekin, H. & Sen, H. 2015. Evaluation of affective temperament and anxiety-depression levels of patients with polycystic ovary syndrome. Journal of affective disorders. 185, 214-218. Doi: https://doi.org/10.1016/j.jad.2015.06.043

Bazarganipour, F., Ziaei, S., Montazeri, A., Foroozanfard, F., Kazemnejad, A. & Faghihzadeh, S. 2013. Body image satisfaction and self-esteem status among the patients with polycystic ovary syndrome. Iranian journal of reproductive medicine. 11(10), 829-836. Accessed 23.11.2023. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3941334/

Canadian Mental Health Association (CMHA). 2023. Connection between mental and physical health. Accessed 20.11.2023. https://ontario.cmha.ca/documents/connection-between-mental-and-physical-health/#:~:text=Mental%20and%20physical%20health%20is,and%20generate%20consequences%20to%20society.

Centers for Disease Control and Prevention (CDC). 2023a. Mental health. Accessed 27.10.2023 https://www.cdc.gov/mentalhealth/learn/index.htm

Centers for Disease Control and Prevention (CDC). 2023b. Social Connectedness. Accessed 30.10.2023 https://www.cdc.gov/emotional-wellbeing/social-connectedness/index.htm

Cesta, C-E., Kuja-Halkola, R., Lehto, K., Iliadou, A-N. & Landén M. 2017. Polycystic ovary syndrome, personality and depression: a twin study. Psychoneuroendocrinology. 85, 63-68. Doi: https://doi.org/10.1016/j.psyneuen.2017.08.007

Cesta, C-E., Månsson, M., Palm, C., Lichtenstein, P., Iliadou A-N. & Landén, M. 2016. Polycystic ovary syndrome and psychiatric disorders: Co-morbidity and heritability in a nationwide Swedish cohort. Psychoneuroendocrinology. 73, 196-203. Doi: https://doi.org/10.1016/j.psyneuen.2016.08.005

Chang, S. & Dunaif A. 2022. Diagnosis of Polycystic Ovary Syndrome: Which Criteria to Use When? 50(1), 11-23. doi: 10.1016/j.ecl.2020.10.002

Charles Sturt University. 2023. Literature Review: Types of literature reviews. Accessed 1.11.2023. https://libguides.csu.edu.au/review/Types

Christ, J. & Cedars, M. 2023. Current guidelines for Diagnosing PCOS. Journal of diagnostics. 13 (6), 1113. doi: 10.3390/diagnostics13061113

CHRON. 2021. What is inductive content analysis? Accessed 22.11.2023. https://smallbusiness.chron.com/inductive-content-analysis-24666.html

Columbia Mailman School of Public Health. 2023. Content analysis. Accessed 26.10.2023. https://www.publichealth.columbia.edu/research/population-health-methods/content-analysis

Dokras, A., Saini, S., Gibson-Helm, M., Schulkin, J., Cooney, L. & Teede, H. 2017. Gaps in knowledge amon physicians regarding diagnostic criteria and management of polycystic ovary syndrome. Fertility and Sterility. 107(6), 1380-1386. Accessed 29.11.2023. https://doi.org/10.1016/j.fertnstert.2017.04.011

Dybciak, P., Humeniuk, E., Raczkiewicz, D., Krakowiak, J., Wdowiak A. & Bojar, I. 2022. Anxiety and Depression in Women with Polycystic Ovary Syndrome. Medicina. 58(7). DOI:10.3390/medicina58070942

Familydoctor.org. Medically reviewed by Rich, R., 2023. Mental health: keeping your emotional health. https://familydoctor.org/mental-health-keeping-your-emotional-health/?adfree=true

Hung, J-H., Hu, L-Y., Tsai, S-J., Yang, A-C., Huang, M-W., Chen, P-M., WangS-L., Lu, T. & Shen, C-C. 2014. Risk of Psychiatric Disorders following Polycystic Ovary Syndrome: A Nationwide Population-Based Cohort Study. PLoS One. 9(5). Doi: 10.1371/journal.pone.009704

IAD Institute for Academic Development, The university of Edinburgh. 2023. Literature review. Accessed 1.11.2023. https://www.ed.ac.uk/institute-academic-development/study-hub/learning-resources/literature-review

Ismayilova M. & Yaya, S. 2022. "I felt like she didn't take me seriously": a multi-methods study examining patient satisfaction and experiences with polycystic ovary syndrome (PCOS) in Canada. BMC women's health. 22(47). Accessed 29.11.2023. https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-022-01630-3

Ismayilova M. & Yaya S. 2023. "I'm usually being my own doctor": women's experiences of managing polycystic ovary syndrome in Canada. International health. 15(1), 56-66. Doi: 10.1093/inthealth/ihac028

Johns Hopkins Medicine. 2023. Polycystic ovary syndrome (PCOS). Accessed 18.10.2023. https://www.hopkinsmedicine.org/health/conditions-and-diseases/polycystic-ovary-syndrome-pcos

Killam, K. 2023. What Is Social Health? Psychology Today. Accessed 30.10.2023 https://www.psychologytoday.com/intl/blog/social-health/202302/what-is-social-health

Kogure, G-S., Ribeiro, V-B., Lopes, I-P., Furtado, C-L-M., Kodato, S., Silva de Sá, M-F., Ferriani, R-A., Lara, L-A-S. & Dos Reis, R-M. 2019. Body image and its relationships with sexual functioning, anxiety and depression in women with polycystic ovary syndrome. Journal of affective disorders. 253, 385-393. Doi: https://doi.org/10.1016/j.jad.2019.05.006

Lizneva, D., Suturina, L., Walidah, W., Soumia, Brakta., Gavrilova-Jordan, L., & Azziz, R. 2016. Criteria, prevalence, and phenotypes of polycystic ovary syndrome. Journal of Fertility and Sterility, 106(1), 6-15. https://doi.org/10.1016/j.fertnstert.2016.05.003

McGowan, M-P. 2011. Polycystic ovary syndrome: a common endocrine disorder and risk factor for vascular disease. Current treatment options in cardiovascular medicine. 13, 289-301. Accessed 29.11.2023. https://link.springer.com/article/10.1007/s11936-011-0130-0

Mieli. 2021. Mielenterveys on osa hyvinvointia ja terveyttä. Accessed 30.10.2023. https://mieli.fi/vahvista-mielenterveyttasi/mita-mielenterveys-on/mielenterveys-on-osa-hyvinvointia-ja-terveytta/

Mohammad, M. & Seghinsara, A. 2017. Polycystic Ovary Syndrome (PCOS), Diagnostic Criteria, and AMH. 18(1), 17-21. Doi: 10.22034/APJCP.2017.18.1.17

Mushtaq R., Shoib, S., Shah, T. & Mushtaq, S. 2014. Relationship Between Loneliness, Psychiatric Disorders and Physical Health? A review on the Psychological Aspects of Loneliness. Journal of Clinical & Diagnostic Research. 8(9). Doi: 10.7860/JCDR/2014/10077.4828

National Institute of Mental Health (NIMH). 2021. Chronic illness and mental health: recognizing and treating depression. Accessed 20.11.2023.
https://www.nimh.nih.gov/health/publications/chronic-illness-mental-health

National Institute of Mental Health (NIMH). 2022. Caring for your mental health. Accessed 20.11.2023. https://www.nimh.nih.gov/health/topics/caring-for-your-mental-health

NHS. 2022. Polycystic ovary syndrome. Accessed 18.10.2023
https://www.nhs.uk/conditions/polycystic-ovary-syndrome-pcos/

NICHD. 2022. Polycystic Ovary Syndrome (PCOS). Accessed 18.10.2023.
https://www.nichd.nih.gov/health/topics/pcos

Singh, S., Pal, N., Shubham, S., Sarma, D.K., Verma, V., Marotta, F., & Kumar, M. 2023. Polycystic Ovary Syndrome: Etiology, Current Management, and Future Therapeutics. Journal of Clinical Medicine. 12(4), 1454. Doi: 10.3390/jcm12041454

Substance Abuse and Mental Health Services Administration (SAMHSA). 2023. Warning signs and risk factors for emotional distress. Accessed 20.11.2023. https://www.samhsa.gov/find-help/disaster-distress-helpline/warning-signs-risk-factors

Syed, M-B-A. & Farhana, Y. 2020. Risk of psychological burden in polycystic ovary syndrome: A case control study in Riyadh, Saudi Arabia. Journal of affective disorders. 274, 205-209. Doi: https://doi.org/10.1016/j.jad.2020.05.086

TENK. 2023. The finnish code of conduct for research integrity and procedures for handling alleged violations of research integrity in Finland. Accessed 1.11.2023.
https://tenk.fi/sites/default/files/2023-11/RI_Guidelines_2023.pdf

Tiitinen, A. 2022. Munasarjojen monirakkulaoireyhtymä (PCOS). Accessed 20.10.2022
https://www.terveyskirjasto.fi/dlk00686

Tomlinson, J., Letherby, G., Millward, Ann. & Stenhouse, E. 2013. Raising awareness of polycystic ovary syndrome. Nursing standard. 27(40), 35-39. Accessed 29.11.2023.
https://www.proquest.com/docview/1371458500?accountid=12003

WHO. 2022. Mental Health. Accessed 27.10.2023. https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

WHO. 2023. Polycystic ovary syndrome. Accessed 7.10.2023. https://www.who.int/news-room/fact-sheets/detail/polycystic-ovary-syndrome

Williams, T., Mortada, R., & Porter, Samuel. 2016. Diagnosis and Treatment of Polycystic Ovary Syndrome. American Academy of Family Physicians. 94(2), 106-113. Accessed 20.10.2023. https://www.aafp.org/pubs/afp/issues/2016/0715/p106.html#treatment

YTHS. Sosiaaliset suhteet. 2023a. Accessed 30.10.2023. https://www.yths.fi/terveystieto/mielenterveys/sosiaaliset-suhteet/

YTHS. Tunnetaidot. 2023b. Accessed 1.11.2023. https://www.yths.fi/terveystieto/mielenterveys/tunnetaidot/

Figures

Tables

Appendices

Appendix 1: The table of final choice of the literature used

Authors, publication year and country	Title	Purpose of the study	Method	Results
Dybciak, P., Humeniuk, E., Raczkiewicz, D., Krakowiak, J., Wdowiak, A. & Bojar, I. 2022. Poland	Anxiety and Depression in Women with Polycystic Ovary Syndrome	To evaluate the relationship of anxiety levels and depression with ego-resiliency and stress-coping methods in women with PCOS.	A cross sectional study involving 230 women with PCOS and 199 control group women matching with age using HADS, Ego-resiliency scale and Coping Orientation to Problems Experiences Questionnaire (Mini-COPE).	Women with PCOS had higher levels of anxiety and depression, ego-resiliency was poorer and passive stress coping methods were significantly more common compared to the control group.
Kogure, G-S., Ribeiro, V-B., Lopes, I-P., Furtado, C-L-M., Kodato, S., Silva de Sá, M-F., Ferriani, R-A., Lara, L-A-S. & Dos Reis, R-M. 2019. Brazil	Body image and its relationships with sexual functioning, anxiety and depression in women with polycystic ovary syndrome	To evaluate body image and possible body image distress (BID) and investigate the association between perceived body image, sexual function, anxiety and depression	A cross sectional study of 100 women with PCOS aged 18-39 with normal, overweight or obese BMI, using Body Shape Questionnaire (BSQ), the Female Sexual Function Index (FSFI) and HADS.	Women with PCOS have problems with self-image not depending on BMI. The un-satisfaction of body-image increased between the subgroups divided by BMI.

Alur-Gupta, S., Chemerinski, A., Liu, C., Lipson, J., Allison, K., Sammel, M-D. & Dokras, A. 2019. United States	Body-image distress is increased in women with polycystic ovary syndrome and mediates depression and anxiety	To evaluate women with PCOS and their body-image distress (BID) scores to control group and if BID mediates anxiety and depression.	A cross-sectional study involving 189 women with PCOS and 255 control group by using the multidimensional body-self relations-appearance subscale (MBSRQ-AS), Stunkard figure rating scale (FRS), hospital anxiety and depression scale (HADS) and PCOS quality of life survey (MPCOS-Q).	Women with PCOS had higher BID scores and BID was connected to anxiety and depression.

Annagür, B-B., Tazegül, A. & Akbaba, N. 2014. Türkiye.	Body Image, Self-Esteem and Depressive symptomatology in Women with Polycystic ovary syndrome	To determine body image, self-esteem and depressive symptomatology	A cross-sectional study involving 83 women with PCOS and 64 healthy women matching with age using Body Image Scale (BIS), Rosenberg Self-Esteem Scale (RSES) and Beck Depression Inventory (BDI).	Women with PCOS have more depressive symptomatology than healthy controls. Depression symptom scores reports of a high prevalance compared to the healthty controls and the previous psychiatric history score was more higher among women with PCOS.
Hung, J-H., Hu, L-Y., Tsai, S-J., Yang, A-C., Huang, M-W., Chen, P-M., WangS-L., Lu, T. & Shen, C-C. 2014. Taiwan	Risk of Psychiatric Disorders following Polycystic Ovary Syndrome: A Nationwide Population-Based Cohort Study	To explore the relationship between PCOS and development of psychiatric disorders.	A cohort study involving 5431 women with PCOS and 21 724 control women without by evaluating later on occurrence of psychiatric disorder diagnoses made by psychiatrists.	Women with PCOS have significantly higher level of developing depression, anxiety disorder and sleep disorder after one year of PCOS diagnosis.

Bazarganipour, F., Ziaei, S., Montazeri, A., Foroozanfard, F., Kazemnejad, A. & Faghihzadeh, S. 2013. Iran	Body image satisfaction and self-esteem status among the patients with polycystic ovary syndrome	To study if PCOS characteristics are associated with psychological well-being mainly focusing on self-esteem and body satisfaction.	Study involving 300 women with PCOS aged 15-40 using the Body Image Concern Inventory (BICI) and Rosenberg's Self-Esteem Scale (RSES).	PCOS women with infertility had lower levels of self-esteem and poorer body satisfaction compared with PCOS women without infertility,
Asik, M., Altinbas, K., Eroglu, M., Karaahmet, E., Erbag, G., Ertekin, H. & Sen, H. 2015. Türkiye	Evaluation of affective temperament and anxiety-depression levels of patients with polycystic ovary syndrome	To evaluate the affective temperaments of women with PCOS and to investigate the association with depression and anxiety levels and laboratory variables compared to healthy controls (HS).	Study involving 71 women with PCOS and 50 healthy control group aged 18-37 by using HADs and Temperament Evaluation of Memphis, Pisa, Paris and San Diego Auto questionnaire (TEMPS-A).	Women with PCOS have liability to irritability, anxiety, depression and cyclothymia, considering that temperament constitutes the basis of mood disorders.

Syed, M-B-A. & Farhana, Y. 2020. Saudi Arabia	Risk of psychological burden in polycystic ovary syndrome: A case control study in Riyadh, Saudi Arabia	To investigate the connection between PCOS and psychological distress such as depression, anxiety and stress and compare it to the general population of Riyadh city hospital.	A case control study involving 82 PCOS cases and 85 control cases by using anxiety and stress scale-21.	Increased prevalence of depression and anxiety compared to the general population - 70% vs. 47%.
Cesta, C-E., Kuja-Halkola, R., Lehto, K., Iliadou, A-N. & Landén M. 2017. Sweden	Polycystic ovary syndrome, personality and depression: A twin study	To examine the role of common genetics behind the comorbidities of neuroticism, PCOS and Major Depressive disorder (MDD).	A cohort study of 12 628 swedish female twins born between 1959-1985 by using questions from the short form of Eysenck Personality Inventory (EPI-Q) and adapted version of the Composite International Diagnostic Interview-Short Form (CIDI-SF).	Women with PCOS have higher score of neuroticism – difficulties with stress coping and more symptoms of acne and a 2-fold increase in odds for a lifetime prevalence of MDD.

Cesta, C-E., Månsson, M., Palm, C., Lichtenstein, P., Iliadou A-N. & Landén, M. 2016. Sweden	Polycystic ovary syndrome and psychiatric disorders: Co-morbidity and heritability in a nationwide Swedish cohort	To test the association between PCOS and psychiatric disorders and study risks for their siblings (female and male) of developing them as well.	A nationwide register-based cohort study involving 24 385 women with PCOS and 25 921 full-siblings of them. Probands were matched randomly to 100 healthy comparison individuals.	22,4% of the women with PCOS had at least one psychiatric diagnose compared to the healthy individuals 15,7%. Women with PCOS also had a significantly higher risk (50%) for schizophrenia, bipolar disorder, MDD and anxiety disorder, eating disorders, tics and autism spectrum disorders.