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The Relationship between Acne and Polycystic Ovary Syndrome: The Impact on Women's Quality of Life

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Abstract

Purpose: One typical sign of hyperandrogenaemia is acne. Among women in their reproductive years, polycystic ovary syndrome (PCOS) is a prevalent endocrine disorder. PCOS is the most frequent cause of hyperandrogenemia in females. Purpose of the current study were to determine the relationship between acne and polycystic ovary syndrome and to determine the impact on women's quality of life.

Methodology: The current study was searched using a variety of key words such as "Acne" "hyperandrogenaemia", "polycystic ovarian syndrome", "Polycystic ovary", "PCOS", "Ovarian Cyst", "Women health and/or PCOS", "quality of life and/or PCOS" and "quality of life and/or acne". Those articles were derived from the data related to PCOS and reported cases were conducted utilizing seven electronic databases (CINAHL, MEDLINE, ProQuest, PubMed, Scopus, Science Direct, and Cochrane) for studies published in various languages from October 2023 to January 2024.

Findings: According to the current study's findings, raising public awareness of PCOS can encourage prospective patients to seek care and receive an early diagnosis, which can result in earlier therapies that are more effective in improving patients' quality of life while also being more affordable. This may be accomplished easily by putting in place appropriate community-wide educational PCOS initiatives and programs, along with support organizations, all of which give the populace accurate and trustworthy information.

Unique contributor to theory, policy and practice: These recommendations may be small but effective ways to lessen the toll PCOS takes on patients and medical services.

Keywords: *Acne, Hyperandrogenaemia, Polycystic Ovarian Syndrome, Polycystic Ovary, Ovarian Cyst, Women Health, Environmental Factors, Androgens, Quality Of Life.*

1. Introduction

1.1 Background

The sebaceous glands are involved in the chronic inflammatory skin disorder known as acne. The development of androgen-induced increased sebum hyperproduction involves four key pathogenesis: inflammation, follicular keratinization changed, increased sebum production, and Propionibacterium acnes (Dréno et al., 2020). In addition, social settings, environmental pollutants, dietary adjustments, and lifestyle modifications—such as prolonged late nights, increased air pollution, sugar consumption, and social media and social networks—have an impact. As a result, acne is becoming more commonplace every year. As per the Global Burden of Disease Study's systematic study, the prevalence of acne worldwide in 2010 was 9.38%, making it the eighth most prevalent condition in the world. There was a 5.1% rise in the prevalence of acne between 2006 and 2016. Meanwhile, the US Food and Drug Administration-approved acne treatments ranged in price from $350 to $3,8061 per person every seven months (Layton et al., 2021).

Acne patients have experienced a commensurate financial burden due to the condition's high frequency and recurrence. Moreover, acne affects the skin and, if left untreated, can leave scars on sufferers, even though it is not a fatal condition. Furthermore, discosmetic dermatosis can easily result in feelings of inadequacy for young men and women, potentially impacting their ability to find work or get married. A study conducted in China found that 30.8% of acne sufferers said their acne negatively affected their quality of life (Shen et al., 2012). Numerous research revealed that acne sufferers have decreased self-esteem, trouble making friends, difficulties in education, and difficulty finding employment (Dreno et al., 2019). Additionally, those with acne are more likely to have underlying mental the median cost of isotretinoin for males and females is $3,227 and $3,806, respectively. Spironolactone is $350, oral antibiotics are $501, topical antibiotics are $920, topical retinoids are $1,805, topical combination antibiotics are $2,282, topical combination antibiotics and retinoids are $3,770. illnesses, such as sadness, anxiety, and suicide (Lukaviciute et al., 2017).

The frequency of acne can affect quality of life, psychological illnesses linked to acne, and the expense of medication therapy. The term "built environment" refers to any structures, areas, and items that have been created or altered by people. In particular, chronic disorders including obesity (Mason et al., 2018), mental health (Helbich et al., 2018), cardiovascular disease (Poelman et al., 2018), and respiratory health are all affected by the built environment, according to mounting data. According to Wang et al. (2019), acne is a chronic condition influenced by a combination of hereditary and environmental variables. Therefore, the constructed environment may also have an impact on it (Figure 1 and Figure 2). Nevertheless, prior epidemiological research on acne has mostly concentrated on social and natural environmental variables (such air pollution and social network) as well as individual factors (including family history, food, lifestyle, occupation, and psychological aspects) (Dréno et al., 2018).

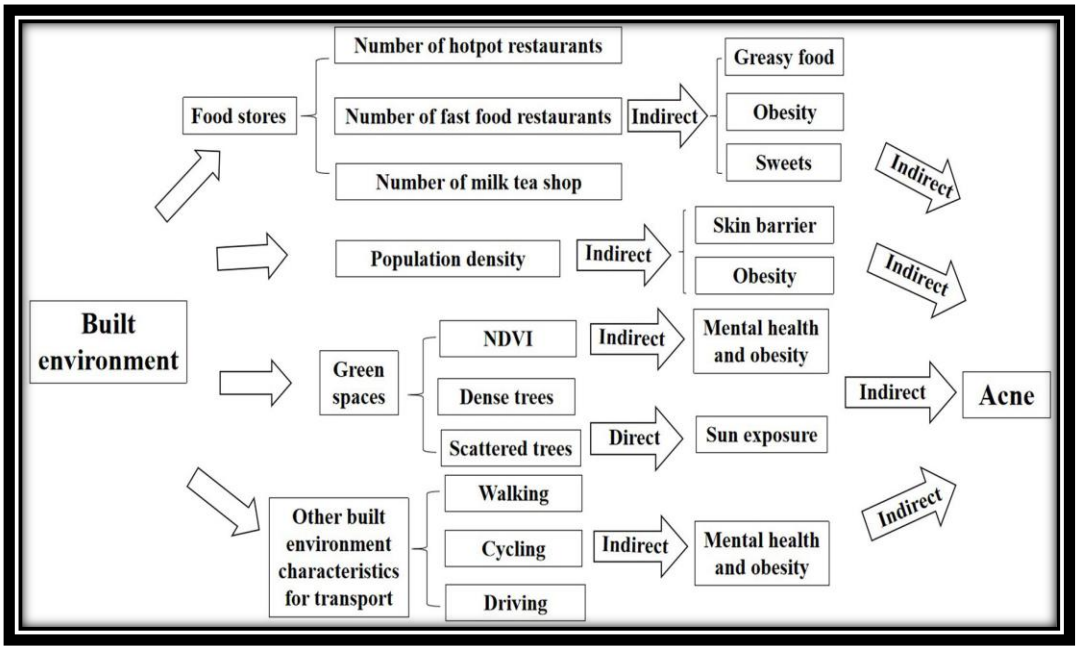

Figure 1. The framework of impacts of built environment on acne (indirect: there is an indirect effect; direct: there is a direct effect).

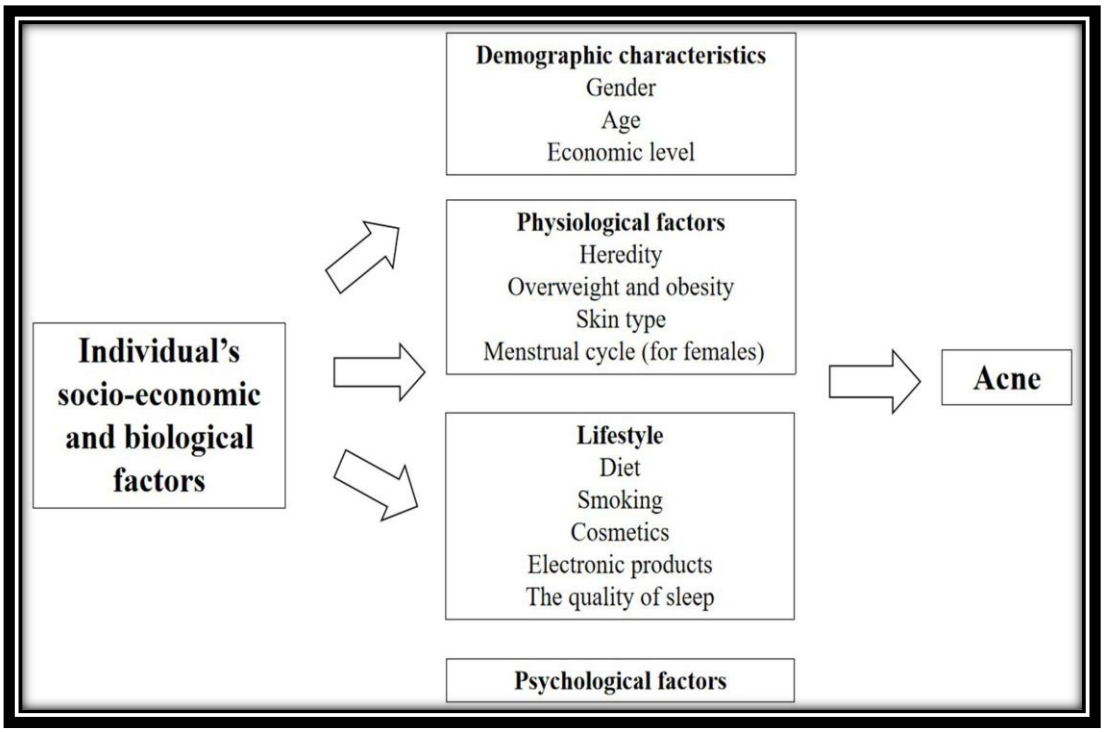

Figure 2. Factors of individual's socio-economic and biological factors affecting acne.

A prevalent hormonal condition that affects women who are of reproductive age is called polycystic ovarian syndrome, or PCOS. Clinical recommendations advise utilizing the PCOS diagnosis criteria after a suitable evaluation of the patient's clinical presentation. When women are

well informed, they will seek medical care when it is needed (Zaitoun et al., 2023). Although psychological discomfort is frequently linked to PCOS, its most common clinical features include hirsutism, acne, and elevated androgen hormone levels (Mehrabadi et al., 2020). Even though PCOS is a prevalent illness, women with various presentations frequently postpone receiving a confirmed diagnosis and treatment due to a lack of information. Since PCOS is still a syndrome, a clinical diagnosis cannot be made using just one diagnostic criterion. Few of the young ladies are aware of the nature of this illness and the early warning signs that should prompt them to seek medical attention. After speaking with the girls, it was discovered that the majority of people view menstrual pain and irregularities as a natural part of their bodies and do not think to see a doctor (Patel and Rai, 2018).

With an incidence of 6 to 8 percent, many patients with PCOS-related acne were unable to start or continue taking oral contraceptive pills (OCPs) because of pill scarring, OCP contraindications, migraines, or smoking. One well-known aspect of PCOS is acne vulgaris (AV), which can cause complications for about 62% of PCOS patients in their adolescent years (Sharif et al., 2016). While OCPs are a commonly used form of birth control, patients may refuse to use them because of side effects and/or medical issues, or doctors may be reluctant to prescribe OCPs due to thrombophilia, migraines, or excessive smoking. Furthermore, a well-conducted study shows that health care practitioners' usage of OCP tends to decline with time. According to research by Seaman HE et al., OCP use dropped by 15–35 percent in those with severe acne (Müderris et al., 2013 and Acmaz et al., 2019).

Endocrine disorders such as PCOS can affect female adolescents. An essential first step in managing PCOS is screening and raising awareness. For the population at risk to engage in health-seeking behaviors that can enhance quality of life, health education is essential. An imbalance in the female sex hormones is linked to PCOS. It is a prevalent health issue among young women and teenage girls. 5–10% of women who are of reproductive age are affected (Sunanda and Nayak, 2016). According to the WHO, 116 million women globally (3.4%) had PCOS (Vaidya and Joshi, 2016). The prevalence of PCOS varies over the world, ranging from 2.2% to 26%. This might be because of the standards by which it was estimated. A prevalence of 22.5% was obtained using Rotterdam criteria, whereas it was 10.7% when the excess androgen association criteria were used (Joshi et al., 2014).

Furthermore, PCOS is a very complicated syndrome with typical metabolic and hormonal characteristics. The illness commonly presents with signs and symptoms that are similar to those of adulthood in adolescent girls, which can make diagnosis challenging (Capozzi et al., 2020). According to Naz et al. (2020), the prevalence according to the Rotterdam criteria was 11.04%, the National Institute of Health reported 3.39%, and the Androgen Excess and Polycystic Ovary Syndrome Society reported 8.03%. PCOS is a chronic illness that typically shows symptoms as adolescence advances, though it can also develop later in life, in early adulthood. Menstrual irregularities and hyperandrogenism symptoms are the disorder's clinical hallmarks, albeit the disorder's severity varies (Huddleston et al., 2020).

It's possible that a lack of awareness is the cause of the rising PCOS prevalence in the community. Because of this, examining PCOS symptoms is essential for early condition diagnosis. Early diagnosis could encourage young women to consult doctors sooner rather than later and avoid long-term issues. Furthermore, it is believed that raising knowledge and comprehension of PCOS is an essential initial step in treating the illness (El Sayed et al., 2020). When it comes to those between the ages of 15 and 40, AV is one of the most common externally apparent skin diseases that dermatologists see. Because definitions of acne and its severity have varied so much throughout research, it is challenging to compare prevalence figures. Many people erroneously believe that acne only affects teenagers. While it does impact over 85% of teenagers, it frequently lingers into adulthood, with 64% of people reporting it to their 20s and 43% into their 30s. Research indicates that among all age groups over 20, women get acne at a higher rate than males (Bhate and Williams, 2013).

Adolescence is a time of transitional physical and psychological development that typically falls between puberty and adulthood. In girls, functional variations in the hypothalamic-pituitary-ovary axis during normal puberty can cause changes in menstrual patterns and reproductive hormones that mimic some of the features of PCOS, making the diagnosis of PCOS more difficult in these cases (Spritzer and Motta, 2015). Concerns regarding overdiagnosis or misdiagnosis in this age group have always existed when using adult diagnostic criteria for teenagers with suspected PCOS (Witchel et al., 2015). While treating PCOS in adolescents early on can help them avoid the long-term emotional, cardio-metabolic, and reproductive effects of the syndrome, overdiagnosing can also negatively impact an adolescent's quality of life and cause unfounded fear about their ability to conceive in the future (Goodman et al., 2015).

Obesity, insufficient physical activity, and a family history of PCOS during puberty transition are risk factors for PCOS. Numerous symptoms are present along with it, including as anovulation, obesity, and abnormal growth of facial and skin hair. Infertility is brought on by changes in the menstrual cycle, ovarian cysts, inability to conceive, and other medical issues. Adolescent screening can offer the chance for early risk factor identification, healthy lifestyle promotion, and early intervention to stop the future development of PCOS condition (Sunanda and Nayak, 2016). Finding women who require treatment depends heavily on public knowledge of the illness's signs and its incurable nature. Not only does awareness of PCOS aid in the diagnosis of the condition, but it also promotes healthy lifestyle choices that improve women's longevity and quality of life (Spritzer and Motta, 2015).

Hormonal imbalances are a major factor in the development of acne. The hormones androgens, oestrogens, progesterone, insulin, and insulin-like growth factor-1 abnormalities are the primary hormones linked to the pathophysiology of acne. Luteinizing hormones (LH) modify gene transcription, which controls baseline androgen production. Androgens cause the sebaceous glands to expand and produce more sebum. Additionally, they result in follicular epithelial cells desquamating abnormally. Propionibacterium acne colonization causes inflammation and the development of papules, pustules, nodules, cysts, and scars. Other hormones, including as

oestrogens, growth hormone, insulin, insulin-like growth factor-1, glucocorticoids, adrenocorticotropic hormone, and melanocortins, also control the production of sebum (Elsaie, 2016 and Lizneva et al., 2016).

The ovaries, the adrenal gland, and the skin—which has the enzymes needed to produce and transform weak androgens into strong androgens—are the three main sources of androgens in women (Ianoşi et al., 2016). In addition to androgens, a variety of other factors are involved in this process, such as heredity, follicular plugging, nutrition, and medicine. It's crucial to keep in mind that a woman with severe acne may also be suffering from a systemic illness like PCOS, which is linked to hormonal and metabolic issues. The literature provides strong evidence for the role of androgens in adult women with acne (Uysal et al., 2017 and Glintborg et al., 2016).

The Global Acne Grading System was used to evaluate acne (GAGS). Six locations are identified by this system: the nose, forehead, chin, each cheek, chest, and upper back. Depending on which of the six places has the most serious lesion, each location is given a score between 0 and 4 (Vankrieken, 1997). A persistent inflammatory condition affecting sebaceous follicles, acne is typified by papules, pustules, nodules, and frequently, scars. Papules and pustules were classified as mild acne; papules, pustules, and nodules as moderate acne; and nodulocystic/acne conglobata (severe acne with numerous abscesses, cysts, and noticeable scarring with sinus) as severe acne (Begum et al., 2012). The US FDA AGSS scale was used to grade acne using a five-category global approach. The five categories on this scale went from: 1. Clear, showing no lesions, either inflammatory or non-inflammatory; 2. Nearly transparent, infrequent non-inflammatory lesions with a single papule or pustule; 3. Mild, a few non-inflammatory lesions with a few papules or pustules but no nodules; 4. Moderate, a few to numerous non-inflammatory lesions, possibly with a single small nodule; 5. Severe, a few to numerous non-inflammatory and inflammatory lesions, but a few nodules **(**Franik et al., 2018**).**

The presence of two of the following three criteria—oligo-and/or anovulation; hyperandrogenism (clinically or biochemically); and polycystic ovary, with exclusion of other aetiology—defines PCOS, a heterogeneous disorder. Acne along with monthly irregularities, a clinical sign of hyperandrogenism (a ratio of LH to FSH equal to or greater than 2), and/or ultrasonography evidence of PCO were the diagnostic criteria for PCOS. Menstrual history included an examination of menstrual parameters such as cycle length (minimum/maximum), irregularities in the cycle, duration of menstrual bleeding, or absence of bleeding without pregnancy. Less than nine periods per year or more than forty days between periods are considered menstrual irregularity. Every participant had a pelvic ultrasound, either transabdominally or transvaginally (for married women). A 5 MHz transvaginal probe or a 3.5 MHz transabdominal (full bladder approach) probe was employed. The morphology of the ovaries was clearly seen. The diagnosis of polycystic ovarian syndrome was made on the basis of the multiplication of tiny subcapsular cysts with thick echogenic stroma (diameter 2–8 mm). When there were several little cysts dispersed throughout the ovary but no dense echogenic centers, PCO was not identified. Furthermore, all patients had blood samples taken for hormonal assays to estimate the serum

concentrations of follicle-stimulating hormone (FSH), luteinizing hormone (LH), and testosterone. Sera were kept frozen at -20ºC until the assay was performed. The hormone measurements were done using radioimmunoassay (Begum et al., 2012).

Numerous genetic and epigenetic alterations, adrenal dysfunction, hypothalamic-pituitary dysfunction, insulin resistance, dyslipidemia, metabolic disturbances, and environmental factors such as sedentary lifestyle, atherogenic tendency, and belly fat deposition are all implicated in the complex pathophysiology (Minocha, 2020). Clinical hyperandrogenism manifested as hirsutism, acne, or alopecia are among the clinical characteristics of PCOS. Primary or secondary amenorrhea, oligomenorrhea, irregular periods, and profuse menstrual flow are all considered forms of menstrual irregularity. Clinical examinations reveal metabolic disorders such as insulin resistance, glucose intolerance, obesity, and dyslipidemia, as well as polycystic ovarian morphology on ultrasound and blood testing. Its clinical appearance may exhibit a notable degree of heterogenicity (Deans, 2019).

PCOS symptoms typically start around menarche, however they can also appear later in life, mainly as a result of environmental factors such excessive weight gain. About 75% of cases have anomalous symptoms, such as infertility, dysfunctional uterine hemorrhage, and/or oligomenorrhea. About 60% of PCOS sufferers have hirsutism, 15% to 20% have acne, and 5% have androgenic alopecia. According to reports, between 30% and 75% of PCOS patients are obese (Pfieffer, 2019). PCOS also affects metabolism, resulting in dyslipidemia, insulin resistance, and irregular glucose metabolism. Additionally, ladies with PCOS tend to gain excess weight, which exacerbates these symptoms. Certain cardiovascular risk factors—like oxidative stress, poor fibrinolysis, and chronic inflammation—are elevated when there is evidence of a higher prevalence of cardiovascular disease. In addition, girls who are impacted are more likely to have symptoms of moderate-to-severe anxiety and despair, low self-esteem, and unfavorable body image (Hachey et al., 2020).

The primary focus of PCOS management is on the irregular menstrual cycle, signs of androgen excess, and related metabolic problems. Common treatment components include weight loss by lifestyle modification, the use of hormonal contraceptives for both androgen suppression and menstrual management, antiandrogens as adjuncts for the treatment of hirsutism, and insulin-sensitizing drugs (Huddleston et al., 2020). Poor lifestyle choices and ignorance are thought to be the main causes of this illness. A wonderful opportunity exists for nurses to raise awareness of this illness. Key components of managing this illness include making educated decisions and managing one's lifestyle, such as controlling stress and losing weight (Sehar, 2020).

1.2 Statement of the problem

One skin condition that is frequently encountered and has a significant effect on quality of life is acne vulgaris. These days, an increasing amount of epidemiological, medical, demographic, and social studies concentrate on several factors that influence acne occurrence (Yang et al., 2020). With aspects related to reproduction, metabolism, and psychology, PCOS is a serious public health

concern. According to Wittel et al. (2019), PCOS is the most prevalent endocrine condition, affecting 6%–20% of women in the reproductive age range. Based on the population investigated and diagnostic criteria employed by Peña et al. (2020), PCOS affects 8–13% of women of reproductive age and 3–11% of teenage girls diagnosed between 10 and 20 years old. The percentage of Egyptian teenage girls with PCOS is 6.6%, while the percentage of those who are at high risk is 12.6%. According to Ibrahim et al. (2017), it is imperative that emphasis be paid to the significance of early diagnosis for this disease within this age range. The most prevalent health issue among adolescents is PCOS, yet it is also the one that is least recognized and underdiagnosed. Globally, the prevalence of this condition is rapidly rising. Teenage females are not well-informed about this illness (Haq et al., 2017).

Early in the course of the disease, cutaneous symptoms of PCOS are present and influence both diagnostic and treatment options. The majority of PCOS patients who seek treatment for these cutaneous indications have either visited or been referred to dermatology clinics. Particularly the cutaneous aspects of PCOS have an impact on psychological health and quality of life. Adolescents and young adults are the typical age range in which acne first appears. This is also true for PCOS patients with acne, as their age was lower than that of those without acne. The only cutaneous characteristic of PCOS that was unrelated to being overweight or obese and that did not frequently coexist with other characteristics was acne. Thus, the only cutaneous symptom of PCOS that manifests itself may be acne. As a result, it is important to detect PCOS in all women with acne and to inquire about their menstrual patterns. A hormonal profile and pelvic ultrasonography for ovarian visualization should be performed on those with menstrual irregularities (Abusailik et al., 2021). So, this study was conducted to determine the relationship between polycystic ovary syndrome and acne and to determine the impact of polycystic ovary syndrome and acne on women's quality of life.

1.3 Research Questions

- What is the relationship between acne and polycystic ovary syndrome?
- What is the impact of acne and polycystic ovary syndrome on women's quality of life?

1.4 Study Aims

Aims of the current study were to determine the relationship between acne and polycystic ovary syndrome and to determine the impact of acne and polycystic ovary syndrome on women's quality of life.

2. Methodology

2.1 Research Design

The current study was designed as integrated literature review to stand on the relationship between acne and polycystic ovary syndrome. Additionally; to determine the impact of acne and polycystic ovary syndrome on women's quality of life.

2.2 Data collection

The current study was searched using a variety of key words such as "Acne" "hyperandrogenaemia", "polycystic ovarian syndrome", "Polycystic ovary", "PCOS", "Ovarian Cyst", "Women health and/or PCOS", "quality of life and/or PCOS" and "quality of life and/or acne". Those articles were derived from the data related to PCOS and reported cases were conducted utilizing seven electronic databases (CINAHL, MEDLINE, ProQuest, PubMed, Scopus, Science Direct, and Cochrane) for studies published in various languages from October 2023 to January 2024.

2.3 Study inclusion criteria

All studies about the relationship between acne and polycystic ovary syndrome as a first line. Additionally, all studies about the impact of acne and polycystic ovary syndrome on women's quality of life.

3. Discussions

With an 83% frequency, acne is a prevalent skin problem associated with PCOS (Gupta et al., 2014). Acne's detrimental effects on patients' psychological well-being, which may compromise cognitive performance (Ergun et al., 2012). We located a few studies on the cognitive abilities of acne vulgaris patients. According to recent research, isotretinoin therapy improves cognitive functions such hippocampal-based learning, executive function, memory, and attention (Fuermaier et al., 2015). Attention deficit hyperactivity disorder (ADHD) affected acne patients twice as much as it affected other patients, according to a retrospective cross-sectional study. A greater prevalence of ADHD in acne suggests a connection between acne and cognitive impairment because ADHD is linked to deficits in working memory, executive function, and attention (Barry et al., 2013).

Deveci et al. (2014) examined the mental capacities of 47 healthy individuals and 66 acne sufferers. When compared to the control group, the acne group performed noticeably poorer on cognitive tests including verbal fluency, learning, and memory (Khoubnasabjafari et al., 2015). Therefore, it's possible that oxidative stress and anxiety and despair brought on by acne scars are the two processes causing cognitive impairment in this disease. Mehrabadi and colleagues' (2020) investigation revealed no connection between acne and cognitive function, in contrast to the earlier research. According to published reports, depression prevalence in women with PCOS ranges from 28% to 64%. Anxiety was shown to be quite prevalent in PCOS patients, with reports ranging from 34 to 57%. The examination of the literature revealed cognitive impairments in the cognitive systems of anxious and depressive individuals, including memory, attention, language performance, executive function, psychomotor function, and brain function (Spritzer, 2014).

Given the importance of the ovary as an organ, it is not surprising that any discomfort or pain at this stage makes women feel under pressure to seek medical advice as soon as possible. Another ovarian follicle grows with each menstrual cycle, and at a certain moment, due to an increase in hormones, it explodes to release an egg ready for fertilization. Yet occasionally,

hormones malfunction. The follicle continues to grow and develops into a pimple, which will eventually stop expanding (Ahmed, 2020).

PCOS, which affects 5–10% of females, is the most prevalent endocrinopathy. According to Zandi et al. (2010), overproduction of ovarian androgens typically causes a wide range of symptoms, such as obesity, insulin resistance, hirsutism, acne, and cardiovascular disease. Acne with irregular menstruation along with other hyperandrogenism symptoms (hirsutism, acanthosis nigricans, alopecia), either with or without an increased level of the LH to FSH ratio (equal to or greater than 2). Begum and colleagues (2012) discovered in their research that 37.3% and 45.37% of acne patients had PCOS. Just 5% of study participants selected campaigns as their information source, and only 14% of them showed enough awareness, therefore the interventional strategies selected to educate the general public must be well-established (Zaitoun et al., 2023).

About 5% to 7% of women who are fertile have PCOS, a complicated illness. Sufficient understanding and a constructive outlook on the illness are crucial for both managing the condition and averting complications. Knowledge and attitude regarding the condition were found to positively correlate with career and educational attainment. Age and marital status, on the other hand, were only found to positively correlate with expertise. It was discovered that the most favored source of information for additional details regarding PCOS was doctors (Aripin et al., 2022). PCOS should receive more attention from medical and health sectors. The study's findings indicate that women between the ages of 21 and 30 and students in the central region have the highest prevalence rates of the illness. Consequently, in order to achieve an early diagnosis, initiate treatment, and minimize the need for further medical and health resources, more focused screening programs should be implemented for those who fit the features of this demographic. Tertiary prevention of PCOS should also be actively pursued (Wu et al., 2021).

Female ovarian cancer, or PCOS, is a specific kind of endocrine condition. An ultrasound can be used to quickly identify a lot of ovarian cysts. Insulin resistance and the overproduction of androgens in the female body are the main causes of PCOS. It is believed that testosterone is the primary cause of PCOS in women and girls (Al-Shattawi et al., 2018). If a woman exhibits at least two of the following three symptoms, she may be diagnosed with PCOS: 1) oligomenorrhea/amenorrhea, 2) polycystic sonographic image in ovaries, and 3) clinical and/or biochemical hyperandrogenism. Based on the Rotterdam criteria, it is the most prevalent hormonal condition in women who are childbearing age. Its prevalence is around 16.6%. (Lauritsen et al., 2014 and Ramos et al., 2016). PCOS symptoms include oligomenorrhea, amenorrhea, obesity, hirsutism, infertility, acne, and anovulation. Several reports have shown that these symptoms can result in anxiety, depression, sexual dysfunction, social maladjustment, and a lower quality of life (Mehrabadi et al., 2017). In addition, a substantial number of studies indicates that depression, anxiety, hirsutism, acne, and androgen hormone levels can all alter cognitive performance (Chaudhari et al., 2018).

PCOS is a multisystem metabolic condition that affects both fertility and quality of life significantly. PCOS can be diagnosed based on the presence of two out of the three diagnostic

criteria listed below: i. Anovulation and/or oligoovulation (less than eight menses in a 12-month period). ii. Laboratory or clinical hyperandrogenism. iii. Polycystic ovaries on ultrasonography (more than 12 follicles measuring 2 to 9 mm in diameter in each ovary and/or greater than 10 ml in total ovarian volume) (Abusailik et al., 2021). According to a Gowri (2015) study, around 90% of people had PCOS cutaneous symptoms. Numerous research has revealed that the most prevalent dermatological symptom is acne, which is followed by hirsutism, seborrhea, AN, and AGA (Hong et al., 2015). According to Feng et al. (2018), the forehead was the site of the majority of acne lesions, followed by the cheek, chin, and nose. Acne was most frequently seen on the face. Given that the majority of women (83%) who had acne also had polycystic ovaries, there is a high association between acne and PCOS (Abusailik et al., 2021).

A key component of PCOS diagnosis is the clinical picture, which highlights the significance of understanding and being aware of the symptoms and indicators of PCOS. For most women, the clinical appearance of PCOS may not be concerning. Moreover, PCOS has been connected to an increased risk of cardiovascular disease, type 2 diabetes mellitus, and endometrial cancer. Menstrual abnormalities and anticipated weight gain in perimenopausal women, for example, may conceal PCOS symptoms in those women. As a result, PCOS patients frequently receive incorrect diagnoses and inadequate evaluations (Pfieffer, 2019). However, it was discovered that women in the general public and healthcare professionals lacked awareness (Piltonen et al., 2019). Interestingly, the majority of research revealed that women were less aware of the consequences of PCOS. This raises concerns since patients may seek early medical attention mostly out of fear of irreversible problems (Zaitoun et al., 2023).

Acne is a common manifestation of hyperandrogenemia. The onset of acne is caused by a variety of causes. Sebaceous gland androgenic stimulation is one of the key elements in its development. The severity of acne is correlated with the amount of excess sebum production. Another possible contributing factor has been identified to be increased susceptibility to androgenic hormones. In the sebaceous glands, the enzyme 5-alpha reductase converts testosterone into the more powerful androgen dihydrotestosterone (Zandi et al. 2010). Although acne is a serious cosmetic condition in and of itself, it may also indicate a more serious medical condition. PCOS is the most frequent cause of hyperandrogenemia in females. The increased activity of androgen-dependent sebaceous glands is one of the major etiologic causes of acne. One important factor in the pathophysiology of acne is the reduction of sex hormone binding globulin (SHBG), which increases the quantity of androgenic products. The cause of PCOS is not entirely known. On the other hand, a good deal of data points to the impact of hereditary variables. This condition may have a hereditary foundation due to its tendency to cluster in families and its high incidence among first-degree relatives, which is roughly five to six times greater than in the general population (Zandi et al. 2010).

Consequently, it is important to inquire about the menstrual cycle and rule out PCOS in all women who present with acne. Menstrual disruption patients should get a pelvic ultrasound and hormonal profile, since these tests can aid in the early detection of PCOS. Nonetheless,

interdisciplinary treatment options, diagnosis confirmation, and giving impacted women comprehensive information all contribute to the improvement of PCOS-related symptoms and prevention of associated complications. It might lessen their psychological discomfort and aid in the better control of their acne (Begum et al., 2012).

Women who have PCOS are more likely to experience psychological and behavioral problems, including anxiety, depression, eating disorders, bipolar illness, negative emotions, and a lower quality of life (QOL). PCOS often presents as obesity and hirsutism during puberty or early adulthood, which negatively impacts young women's self-esteem and quality of life. Psychopathology affects women with PCOS more frequently than it does healthy women. The creation of suitable interventions was emphasized in the recent consensus report on the health-related elements of PCOS that affect women. It was advised that mental health concerns be taken into account for all women with PCOS. One's quality of life is significantly impacted by PCOS, one of the most common endocrine illnesses affecting teenage and young girls. In recent decades, quality-of-life (QOL) has gained popularity and attracted the interest of scholars and enthusiasts alike (Emem and Hassan, 2017).

A QOL term that considers the effect an illness has on a person's quality of life is health-related quality of life (HRQOL) (Mohammed et al., 2018). Oncology is interested in QOL difficulties since more long-term survivors are being diagnosed and treated with effective modern approaches (Mostafa et al., 2018). Numerous investigations focused on this subject field have led to a large increase in QOL (Nady et al., 2017). QOL takes into account all of the effects of a disease and represents an evaluation of it that is influenced by a person's level of independence, social relationships, psychological state, physical health, and personal beliefs, among other complex factors (Nady et al., 2018).

According to Nady et al. (2018), QOL is a multidimensional notion that encompasses areas relating to physical, mental, and social components (see Figure 3). It focuses on the influence that health status has on quality of life (QOL) rather than only population health and causes of death (Nady et al., 2018). Kobau et al. define QOL as well-being as the evaluation of a person's positive life elements, including life satisfaction and happy feelings. According to Kobau et al. (2010), well-being is a relative condition in which an individual maximizes their physical, mental, and social functioning within the framework of supportive circumstances in order to lead a complete, productive, and satisfying life. The symptoms a patient presents with determine the course of treatment for women with PCOS. Three groups usually comprise symptoms: (1) diseases connected to menstruation, (2) symptoms associated to androgens, and (3) infertility. Management consists of OCPs are the first choice for treating acne, irregular menstruation, and hirsutism in premenopausal women. One safe way to get rid of extra body hair is to use laser therapy. For the treatment of symptoms associated with PCOS, spironolactone is frequently used with OCPs (Badawy and Elnashar, 2011).

PCOS is a multifaceted and intricate endocrine and metabolic illness affecting women at any stage of life. It can result in several health issues such as irregular or irregular menstruation,

infertility, acne, hirsutism, obesity, and metabolic syndrome (Zhao et al., 2016). In the last ten years, research on the detrimental effects of this diverse disease on psychological aspects (worsen QOL, depression, and anxiety) has grown significantly (Hassan and Farag, 2019). Early on in the course of the disease, PCOS causes subclinical cellular damage, which may have numerous negative long-term effects. This suggests that preventative measures and treatments must be put into place, often beginning early in the onset of symptoms (Bednarska and Siejka, 2017).

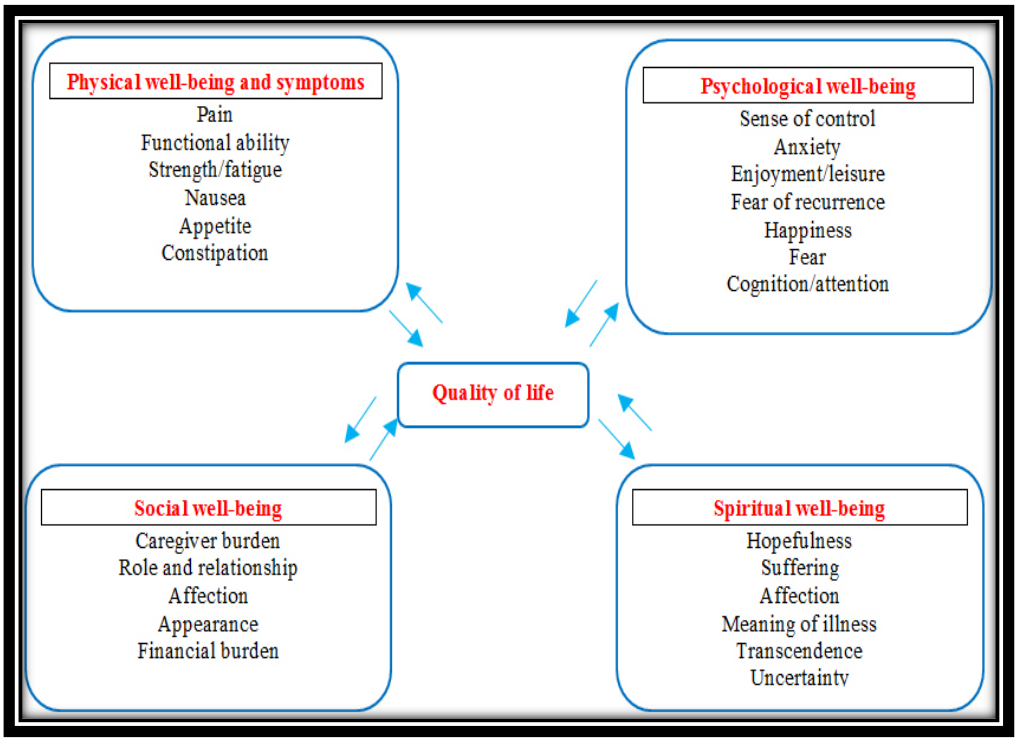

Figure 3. Dimensions of QOL (Yarbro et al., 2016)

In addition to issues with cycle management, acne, and hirsutism, PCOS has also been closely associated with dyslipidemia and cardiovascular disease. Furthermore, hypertension is a risk factor for postmenopausal women with PCOS (Doroszewska et al., 2019). Women with PCOS are also more likely to experience sleep disruptions or obstructive sleep apnea. According to estimates, these women had a 2.7-fold higher lifetime risk of endometrial cancer than women without this condition (Dumesic and Lobo, 2013). The primary reason for the development of endometrial cancer is prolonged, unopposed ovulation that occurs in the endometrium. Numerous studies have demonstrated the high risk of infertility that women with PCOS face. In the event that they do conceive, a meta-analysis found that these women also have a higher chance of pregnancy complications like gestational diabetes and preeclampsia, which can have a detrimental impact on the health of the unborn child. Furthermore, a number of studies have found that these women had a markedly higher incidence of depressive disorders, which may be partially accounted for by the comorbidities and physical changes. Given all of the disease's consequences, it's critical to

recognize the significant effects it has on patients' physical, psychological, and social well-being (Veltman et al., 2012).

Therefore, early PCOS diagnosis is essential to lowering the risk of unfavorable consequences. Several studies indicate that women have little to no awareness of PCOS, despite the substantial issues that could arise in those who have the condition (Patel and Rai, 2018). According to Mohammed et al. (2015), the majority of the women in the study group are ignorant about the problems connected to this condition. According to a study done on teenage females, they are unable to change their lifestyle behaviors since they are unaware about PCOS and have a negative attitude about it (AlSinan and Shaman, 2017). Given the significance of female population knowledge and awareness of PCOS and its correlation with the disorder's prognosis, determining one's level of knowledge is a crucial component of managing the illness (Aripin et al., 2022).

In order to properly manage a PCOS case and lessen the disease's physical and psychological burden, a multidisciplinary approach involving gynecologists, dermatologists, endocrinologists, psychiatrics, and nutritionists should be used (Abusailik et al., 2021). Nurses can help girls with PCOS by providing knowledge and counseling. Offer assistance to a teenage girl who is experiencing a low self-image as a result of her PCOS physical manifestation. Help the girl learn about the condition and the risk factors that go along with it so that long-term health issues can be avoided. Motivate the teenage girl to adopt healthier lifestyle choices. Send the teenage girl to nearby support groups so she can develop the necessary coping mechanisms (Choragudi et al., 2018). Furthermore, PCOS care plans are best presented as comprehensive, lifelong, educational approaches to wellbeing, and nurses are well-positioned to develop and administer these methods. Nurses can offer counseling with educational support in the form of written or electronic materials to promote engagement. A good plan will address nutrition education, meal planning, physical activity, mental and emotional health, weight and stress reduction strategies. (Goetsch et al., 2020 and Mohamed et al., 2022).

4. Conclusion

The study's findings suggest that PCOS is a frequent condition affecting women with acne and is not always linked to outward manifestations like obesity or hirsutism. In women with acne, the LH/FSH ratio and menstrual disorders were the most significant indicators of PCOS. In conclusion, it is clear that adolescent and adult women are unaware of PCOS. The degree of knowledge may be indicative of a general lack of awareness among the populace, which is insufficient to stop the underlying disease from progressing further nor is it adequate to encourage future patients to seek medical attention when needed. Fortunately, an early diagnosis can readily avert the significant consequences caused by PCOS; however, this is only possible if prospective patients are fully informed about the illness. PCOS negatively affects the psychological, social, and phenotypic aspects of QOL as well as the overall QOL scale, which results in low QOL among women. PCOS affects women of childbearing age and manifests itself cutaneously in a variety of ways. PCOS is strongly linked to hirsutism and acne. The presence of these skin characteristics,

particularly in females who are overweight or obese, should notify the doctor that PCOS may be present. Dermatologists are key players in the therapy of these patients as part of a multidisciplinary approach.

5. Recommendations

Based on the foregoing study results, the following recommendations are suggested:

- Dermatologists, obstetricians, and nurses in gynaecologic and obstetrics clinics should organize educational sessions for adolescents regarding PCOS regarding the causes, symptoms, and signs and the management, with the development of teaching materials in the form of posters and booklets.
- Improving women's knowledge regarding acne with a periodic screening of women for early detection and management of PCOS.
- Programs for promoting health via various media to enhance the quality of life for acne-affected women.
- Every woman who has acne should have her menstrual cycle inquired about, have any underlying PCOS investigated, and have any additional signs of hyperandrogenism checked.
- Menstrual disturbance patients should undergo both a pelvic ultrasound for ovarian visualization and a hormonal profile determination. Possible consequences can be avoided with early diagnosis and treatment.
- More awareness-raising initiatives about PCOS and acne should be organized by the health sector, with a greater emphasis on the long-term consequences.
- Patients with acne and PCOS should receive optimal advice and communication from healthcare specialists.
- By taking a history, examining the patient, and performing hormonal assays and pelvic ultrasonography if needed, all female patients with acne should be tested for PCOS and acne.

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