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Original article

Prevalence of Polycystic Ovarian Syndrome in Alkhoms City, Libya: A Cross-sectional study

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Abstract
Polycystic Ovarian Syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age. This study investigates the prevalence of PCOS, focusing on patient-related and disease-related factors. A cross-sectional survey was conducted to explore obstetricians' and gynecologists' perspectives on the diagnosis, prevalence, and management of PCOS. A total of 35 specialists, each with at least three years of clinical experience, participated. The survey included open-ended questions covering patient-related factors (e.g., symptoms, lifestyle) and disease-related aspects (e.g., prevalence, diagnostic methods, treatment). Data were collected through face-to-face interviews from January to April 2022, ensuring confidentiality and standardized procedures to minimize bias. This study analyzed PCOS's prevalence, etiology, symptoms, diagnosis, and treatment. The highest prevalence (62.9%) was observed in the 20–29 age group, declining with age. Unknown causes accounted for 51.42% of cases, followed by hormonal and genetic factors (41.42% each). Menstrual irregularity (80%) was the most common symptom. Ultrasound was the primary diagnostic tool (82.85%), while metformin was the most prescribed treatment (71.42%). PCOS was the most prevalent condition among gynecological disorders (57.14%). These findings highlight the significant burden of PCOS and the need for improved management strategies. Our study concluded that the PCOS remains a significant health concern both globally and within Libya. Highlights the necessity for heightened awareness, early screening, and tailored management strategies. Further research is warranted to explore the underlying causes of regional prevalence variations and to develop culturally appropriate interventions that address the unique needs of the Libyan female population.
Keywords. PCOS, Hyperandrogenism, Endocrine Disorders, Infertility.

Introduction

Polycystic Ovary Syndrome (PCOS) is a prevalent endocrine disorder affecting women of reproductive age, characterized by irregular menstrual cycles, hyperandrogenism, and polycystic ovarian morphology [1,2]. The precise etiology of PCOS remains incompletely understood; however, it is thought to result from a multifaceted interplay of genetic predisposition, hormonal imbalances, and environmental influences. Its diagnosis poses a significant challenge due to its clinically heterogeneous presentation [3,4]. Although PCOS itself is not life-threatening, it is associated with an increased risk of comorbidities such as obesity, insulin resistance, type 2 diabetes, cardiovascular diseases, and endometrial cancer, which may lead to severe and potentially life-threatening complications [5,6].

Globally, the prevalence of PCOS varies widely, influenced by diagnostic criteria and the population studied. Estimates range from 2% to 20% among women aged 18 to 44, depending on the definitions applied. The World Health Organization estimated that, as of 2010, PCOS affected approximately 3.4% of women worldwide, equating to about 116 million individuals. A more recent meta-analysis reported a global prevalence of 9.2%, with regional variations: Asia at 11.37%, Europe at 4.30%, and the Americas at 4.7% [7,8]. A longitudinal cross-sectional study conducted at the Tripoli Fertility Center evaluated 603 women attending the gynecology and obstetrics department between January 2020 and December 2022. The study reported a PCOS prevalence of 29.56% in 2020, 37.5% in 2021, and 20.27% in 2022. The mean age of participants diagnosed with PCOS was 34.9 years. A significant finding was that all PCOS cases exhibited insulin resistance. Additionally, 68.96% of the PCOS group were classified as morbidly obese (BMI >35), and approximately 68.39% had a waist circumference exceeding 88 cm [9].

A Pelvic Ultrasound is a major diagnostic tool for PCOS. IN addition to a laparoscopic examination, serum levels of androgens, including androstenedione and testosterone, may be elevated [10]. The present study aimed to evaluate the prevalence of PCOS based on clinical insights gathered through a survey of obstetricians and gynecologists in Alkhoms City, Libya.

Methods

Study Design

A cross-sectional survey was conducted to assess the perspectives of obstetricians and gynecologists regarding the diagnosis, prevalence, and management of PCOS. This design was selected due to its effectiveness in capturing data at a single point in time, providing a comprehensive overview of current

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clinical practices and attitudes. The study aimed to gather insights into patient-related factors (including lifestyle, symptoms, and medical history) and disease-related aspects (such as prevalence, diagnostic methods, and treatment approaches). The survey methodology allowed for the collection of qualitative data to facilitate a thorough analysis of the topic.

Participants

A total of 35 obstetricians and gynecologists participated in the survey. These healthcare professionals were selected based on their specialization in obstetrics and gynecology and their active involvement in the diagnosis and treatment of PCOS. Inclusion criteria required participants to have at least three years of clinical experience in the field and current practice in a hospital, clinic, or private setting.

Survey Structure

The survey was designed to collect qualitative data and was divided into two primary sections: patient-related factors and disease-related factors. The patient-related section included open-ended questions on demographic variables such as patient age, lifestyle factors (including diet and physical activity), and common symptoms (such as menstrual irregularities, hirsutism, and infertility). The disease-related section focused on clinical approaches to diagnosis, the perceived prevalence of PCOS, and the treatment strategies employed by the respondents. The survey comprised open-ended questions, allowing participants to provide detailed, free-text responses. This format was chosen to capture nuanced insights and to allow participants to elaborate on clinical challenges, emerging trends, and personalized approaches to patient care.

Data Collection

Data were collected through face-to-face interviews conducted between January and April 2022 in Alkhoms City, Libya. Each participant was provided with an explanation of the study's objectives, and informed consent was obtained before the interview. Interviews were conducted in a standardized manner to minimize interviewer bias and ensure consistency in data collection. The duration of each interview ranged from 20 to 30 minutes, allowing for comprehensive responses while maintaining participant engagement. Participants were assured of the confidentiality and anonymity of their responses to promote honest and accurate reporting.

Data analysis

Microsoft Office Excel with descriptive statistics was used for analyzing the collected data from questionnaires and prescriptions to identify medical errors.

Results

Relation between age and PCOS

The analysis of the relationship between age and the prevalence of Polycystic Ovary Syndrome (PCOS) revealed a distinct pattern. The highest prevalence was observed in the 20–29 age group, which accounted for 62.9% of cases, followed by the 30–39 age group with a prevalence of 28.6%. A further decline was noted in the 40–49 age group, where the prevalence reached 8.5%. Notably, no cases were reported among individuals younger than 20 years or those aged 50 years and above. These findings indicated that PCOS was most commonly diagnosed during early adulthood and the reproductive years, with a significant decrease in prevalence among older age groups. The results were illustrated in Figure 1.

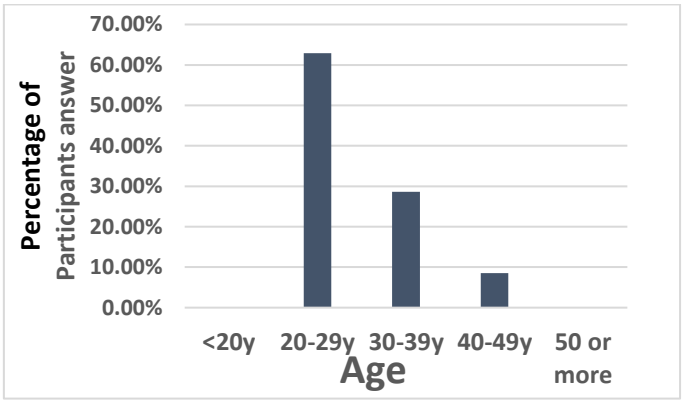

Figure 1: Relation between age and PCOS

Causes of PCOS

Figure (2) shows the etiological factors of polycystic ovary syndrome (PCOS) indicates that the highest proportion of cases (51.42%) were attributed to unknown causes. This was followed by hormonal imbalance

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and genetic factors, each accounting for 41.42% of cases. Lifestyle factors contributed to 22.85%, while insulin resistance was identified in 20% of cases. Infertility was reported as a cause in 8.50% of cases. Autoimmune diseases had the lowest prevalence, accounting for 2.85%.

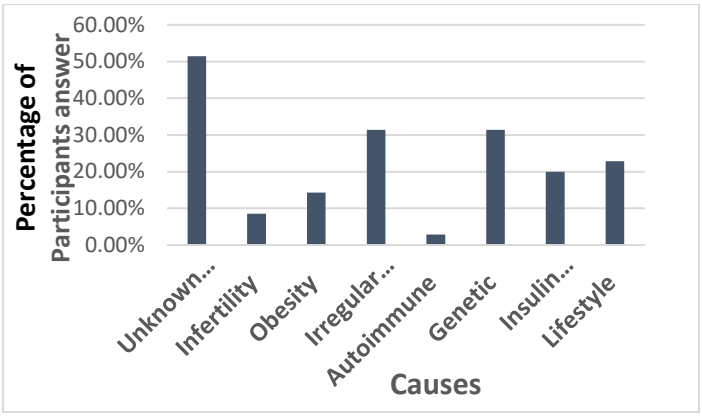

Figure 2: Causes of PCOS

Symptoms of PCOS

The analysis of the symptoms associated with PCOS revealed that the most prevalent symptom was menstrual irregularity, affecting 80% of cases. This was followed by obesity, reported in 62.90% of cases, and hirsutism, which was observed in 54.30% of cases. Delayed conception was noted in 31.40% of cases, while acne was reported in 17.14%. The least common symptom was amenorrhea, occurring in 11.40% of cases. These findings are illustrated in Figure 3.

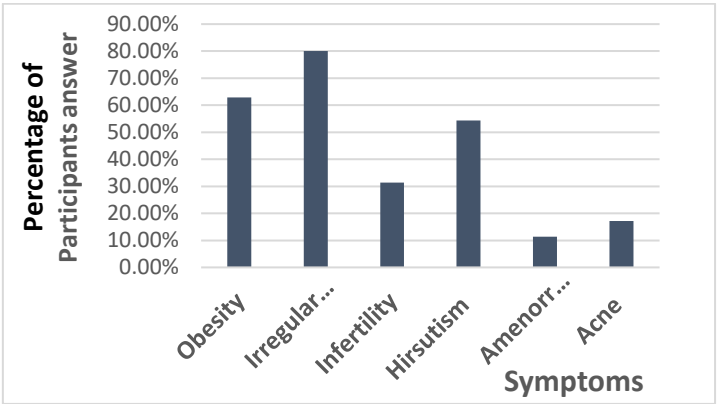

Figure 3: Symptoms of PCOS

Diagnosis methods of PCOS

Figure (4) shows the questionnaire results regarding the diagnostic methods for PCOS revealed that ultrasound was the most commonly used method, reported in 82.85% of cases. This was followed by laparoscopy at 20% and medical history assessment at 17.14%. Hormonal analysis, free testosterone testing, and endometrial biopsy were utilized in 11.43%, 5.70%, and 2.85% of cases, respectively.

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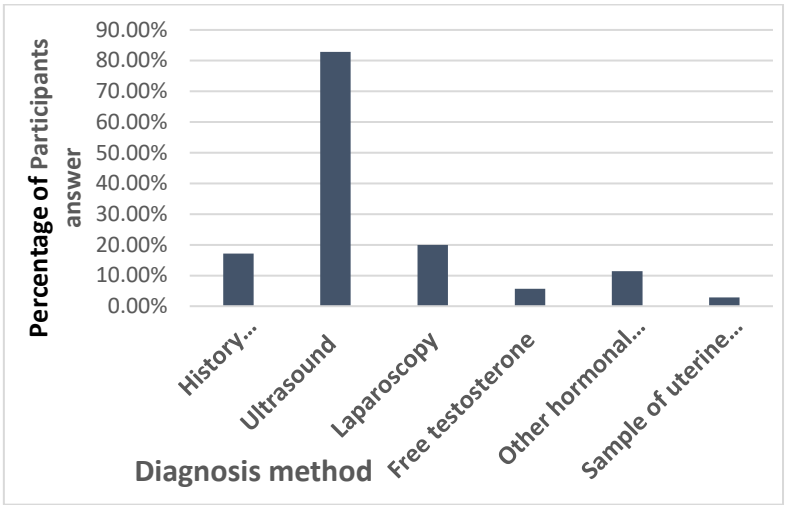

Figure 4: Diagnosis method of PCOS

Treatment of PCOS

Regarding the treatment of PCOS, the results indicated that metformin was the most commonly used treatment, reported in 71.42% of cases. This was followed by Clomid at 34.28% and lifestyle modification at 31.42%. Both Lazar and hormone therapy were used at an equal rate of 22.85%. Similarly, laparoscopy and contraceptive tablets were each reported in 17.14% of cases. Dopamine agonists (Dostinex) and surgical interventions were used in 8.75% of cases, while androgen therapy and dydrogesterone (Duphaston) were each reported in 5.70% of cases. Finally, Nosifol sachet was the least commonly used treatment, with a prevalence of 2.85%. These findings are illustrated in Figure 5.

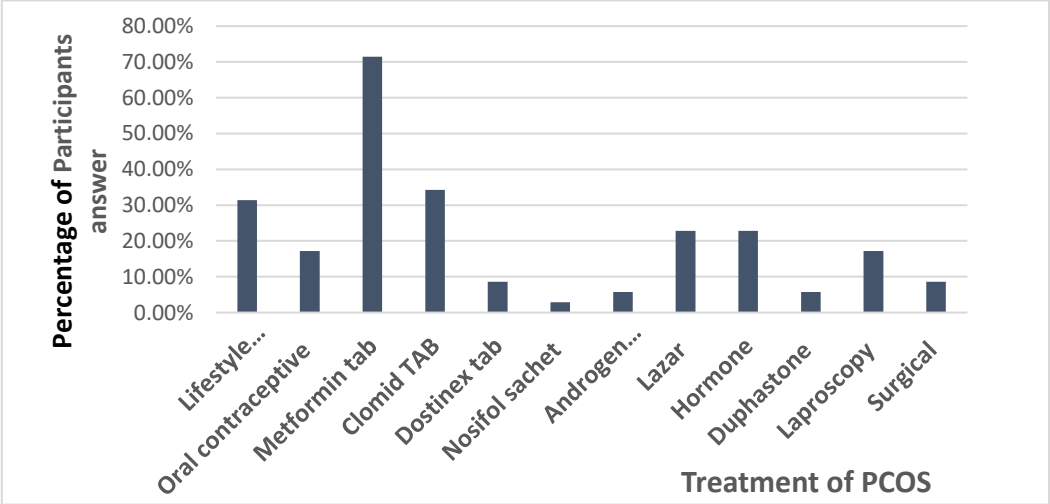

Figure 5: Treatment of PCOS

Most prevalent diseases affecting women

Figure (6) shows the comparison of PCOS prevalence with other diseases affecting women, which was the primary objective of this study, the analysis of responses from obstetrics and gynecology specialists indicated that PCOS was the most prevalent condition, reported in 57.14% of cases. The prevalence rates of other diseases were as follows: urinary tract infections (42.85%), anemia (22.85%), pelvic inflammatory disease (20%), vitamin D deficiency (17.14%), menstrual irregularities (11.42%), and infertility (5.71%). Additionally, some diseases, including diabetes, preeclampsia, and uterine inflammation, lower abdominal pain, had an equal prevalence of 2.90% each.

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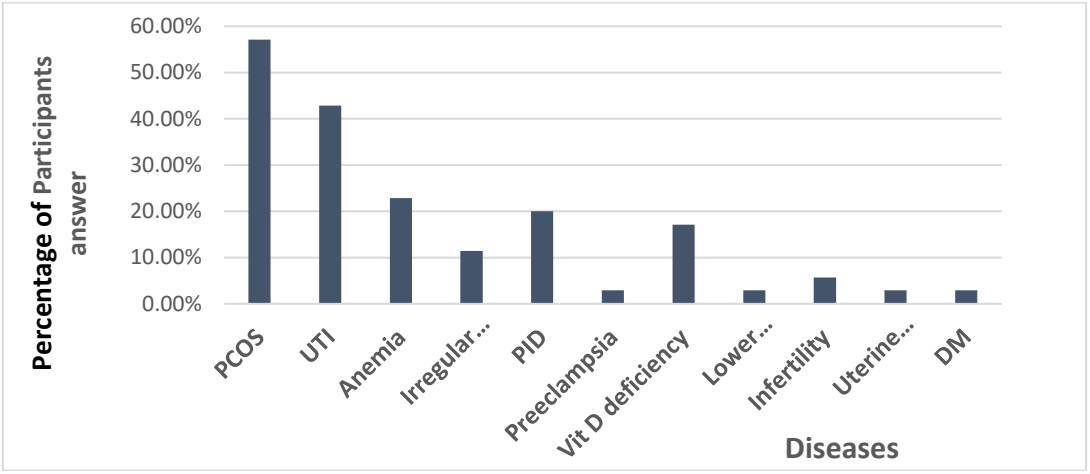

Figure 6: Most prevalent diseases affecting women

Discussion

The findings of this study highlight a distinct pattern in the prevalence of Polycystic Ovary Syndrome (PCOS) across different age groups, with the highest occurrence observed in the 20–29 age group (62.9%). This aligns with global studies indicating that PCOS is most commonly diagnosed during early adulthood and reproductive years. For instance, a study conducted in India by Nidhi et al. (2011) [11] reported that the highest prevalence of PCOS was among women aged 18–25 years, suggesting that hormonal changes and reproductive maturity play a critical role in disease manifestation. Similarly, research in Europe (Teede et al., 2018) [12] indicated a peak prevalence in women in their 20s, followed by a decline with increasing age, which is consistent with our findings. In addition, our results agree with Hayat Abdalla et al 2021 [13] who found that the mean age of participants was 23.8 years. The absence of cases in individuals younger than 20 years and those aged 50 years and above suggests that PCOS primarily affects women of reproductive age and decreases as hormonal fluctuations stabilize with aging.

Regarding etiological factors, our study found that unknown causes accounted for the highest percentage of cases (51.42%), followed by hormonal imbalance and genetic factors (41.42% each). These findings align with prior studies, such as Goodarzi et al. (2011) [14], which emphasized the multifactorial nature of PCOS, including genetic predisposition, metabolic dysfunction, and environmental influences. Moreover, the contribution of lifestyle factors (22.85%) and insulin resistance (20%) in this study reflects global trends, as demonstrated by a study by Diamanti-Kandarakis et al. (2006) [15], which highlighted the role of obesity and insulin resistance in the pathophysiology of PCOS.

The symptomatology analysis revealed that menstrual irregularities (80%) were the most common symptom, followed by obesity (62.9%) and hirsutism (54.3%). These findings are consistent with studies from other regions, such as a study in the United States (Azziz et al., 2004) [16], which identified menstrual dysfunction and hyperandrogenism as the hallmark features of PCOS. The relatively lower prevalence of amenorrhea (11.4%) in our study contrasts with some reports indicating a higher occurrence, suggesting potential regional or genetic variations in symptom presentation.

In terms of diagnostic methods, ultrasound was the most frequently used technique (82.85%), followed by laparoscopy (20%) and hormonal analysis (11.43%). This finding is supported by Rotterdam Criteria (2003) [17], which emphasize ultrasound and clinical evaluation as primary diagnostic tools. A study conducted in Egypt (Abdelazim & AbuFaza, 2015) [18] reported similar diagnostic patterns, confirming the widespread reliance on ultrasound for PCOS detection.

Treatment patterns in this study demonstrated that metformin (71.42%) was the most commonly prescribed medication, aligning with international recommendations for managing insulin resistance in PCOS (Legro et al., 2013) [19]. The frequent use of Clomid (34.28%) corresponds with studies highlighting its effectiveness in inducing ovulation among women with PCOS-related infertility (Johnson, 2014) [20]. Lifestyle modifications (31.42%) were also commonly recommended, reinforcing global guidelines advocating for weight management and dietary interventions as first-line therapies (Moran et al., 2011) [21].

Lastly, the comparison of PCOS prevalence with other female-related diseases revealed that PCOS was the most common condition (57.14%), surpassing urinary tract infections (42.85%) and anemia (22.85%). This aligns with global epidemiological data indicating that PCOS is one of the most prevalent endocrine disorders among women of reproductive age (March et al., 2010) [22]. The significant prevalence of menstrual irregularities (11.42%) and infertility (5.71%) further underscores the impact of PCOS on women's reproductive health.

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These findings contribute to the growing body of literature on PCOS and highlight the need for early diagnosis, effective management strategies, and increased awareness, particularly in Libya, where research on this topic remains limited. Future studies should explore the genetic and environmental determinants of PCOS in this region to enhance our understanding and improve patient outcomes.

Conclusion

Our results show that the high prevalence of PCOS among women in Alkhoms City, Libya, making it the most commonly reported condition among gynecological disorders and it remains a significant health concern both globally and within Libya. Highlights the necessity for heightened awareness, early screening, and tailored management strategies. Further research is warranted to explore the underlying causes of regional prevalence variations and to develop culturally appropriate interventions that address the unique needs of the Libyan female population.

Conflict of interest. Nil

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المستخلص

تُعد متلازمة تكيس المبايض من أكثر الاضطرابات الغددية شيوعًا التي تصيب النساء في سن الإنجاب. تهدف هذه الدراسة إلى معرفة معدل انتشار متلازمة تكيس المبايض، مع التركيز على العوامل المتعلقة بالمرضى والمرض نفسه. أُجريت دراسة مقطعية لاستكشاف آراء أطباء النساء والولادة حول تشخيص متلازمة تكيس المبايض ومدى انتشارها وطرق علاجها. شارك في الدراسة 35 طبيبًا متخصصًا، يتمتع كل منهم بخبرة سريرية لا تقل عن ثلاث سنوات. شمل الاستبيان أسئلة مفتوحة تناولت العوامل المتعلقة بالمرضى (مثل الأعراض ونمط الحياة) والجوانب المتعلقة بالمرض (مثل معدل الانتشار، وطرق التشخيص، والعلاج). تم جمع البيانات من خلال مقابلات مباشرة خلال الفترة من يناير إلى أبريل 2022، مع ضمان السرية واتباع الإجراءات القانونية. وضحت هذه الدراسة معدل انتشار متلازمة تكيس المبايض وأسبابها وأعراضها وطرق تشخيصها وعلاجها. وُجد أن الفئة العمرية 20-29 عامًا سجلت أعلى نسبة انتشار (62.9%)، مع تناقص النسبة مع تقدم العمر. وكانت الأسباب غير معروفة في 51.42% من الاستبيانات، تلتها العوامل الهرمونية والوراثية (بنسبة 41.42% لكل منهما). كانت اضطرابات الدورة الشهرية أكثر الأعراض شيوعًا (80%). وكان الفحص بالموجات فوق الصوتية هو الأداة التشخيصية الأساسية (82.85%)، بينما كان الميتفورمين العلاج الأكثر وصفًا (71.42%). كما تبين أن متلازمة تكيس المبايض هي الاضطراب الأكثر انتشارًا بين أمراض النساء (57.14%). تؤكد هذه النتائج المشاكل الكبيرة الذي تسببها متلازمة تكيس المبايض، مما يستدعي تطوير استراتيجيات محسنة للتشخيص والعلاج. خلصت هذه الدراسة إلى أن متلازمة تكيس المبايض لا تزال تشكل مصدر قلق صحي كبير، سواء على المستوى العالمي أو في ليبيا. وتؤكد هذه النتائج الحاجة إلى زيادة الوعي، وتعزيز الفحوصات المبكرة، وتطوير استراتيجيات علاجية مخصصة. كما أن هناك حاجة لإجراء المزيد من البحوث لاستكشاف الأسباب الكامنة وراء التباينات الإقليمية في معدل الانتشار.

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