

# Factors Contributing to Higher Risks of Women's Reproductive Diseases

Alya Naik

Received March 08, 2025

Accepted June 22, 2025

Electronic access July 15, 2025

In this paper we investigate the various factors that contribute to women's reproductive diseases. Factors such as genetic, environmental, and lifestyle contribute to numerous reproductive diseases. This study uses a systematic literature review, which involves carefully analyzing existing research to identify patterns and key findings in this area. By reviewing a wide range of studies, the methodology helps ensure a comprehensive understanding of how these different factors impact reproductive health. Through this systematic approach, the paper provides a clear and reliable basis for its conclusions about the importance of diet, social disparities, and healthcare access in improving reproductive outcomes. The review finds that epigenetic factors such as environmental and lifestyle factors have a greater impact on reproductive outcomes than genetic factors. While genetics still play a role in determining susceptibility, environmental exposures and behaviors can trigger or worsen conditions like PCOS and endometriosis. Additionally, disparities based on race and socioeconomic status are linked to poorer reproductive health outcomes. These disparities often reflect differences in environmental exposures, access to healthcare, and levels of chronic stress. This research highlights the need to address social determinants of health and improve education, policy, and prevention strategies. Ultimately, a deeper understanding of these factors will allow for more targeted treatments and improved health outcomes for women. By exploring the factors that contribute to higher risks of women's health diseases, this review hopes to educate readers and provide suggestions to bring attention to the need for more research into the genetic causes of these conditions, better personalized treatments, and overall healthcare improvement for women to help reduce the prevalence of these diseases.

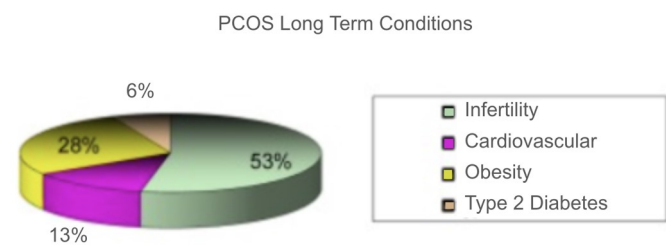
**Keywords:** Reproductive Health, Menstrual, Environment, Diet, Epigenetics, Women of Color

## Introduction

Reproductive health is essential in overall well-being, yet millions of women globally suffer from reproductive diseases that remain underdiagnosed and misunderstood. This review aims to find which among genetic, environmental, dietary, and socioeconomic factors most significantly contribute to the risk of women's reproductive diseases, and how these factors interact.

Women's reproductive health encompasses a range of conditions that affect the female reproductive organs and related systems. These conditions vary widely, from relatively mild and treatable disorders to those that are life-threatening. One of the most common conditions is Polycystic Ovarian Syndrome (PCOS). PCOS is a hormonal disorder in which the ovaries produce an excess amount of androgens, interfering with the regular menstrual cycle. PCOS can cause irregular periods, ovarian cysts, and symptoms, like acne and excess hair growth, while also increasing the risk of diabetes and heart disease<sup>1</sup>. In addition, many women with PCOS experience fertility challenges, making it a leading cause of infertility<sup>2</sup>. D. Weber et al found that health conditions such as infertility, cardiovascular disease, obesity, and type 2 diabetes, are most likely to develop in women

with PCOS (Figure 1). Figure 1 presents the percentage breakdown of these long-term conditions among women diagnosed with PCOS, showing that infertility is the most commonly reported issue, followed by cardiovascular disease, obesity, and type 2 diabetes. This distribution highlights the impact of PCOS beyond the reproductive system, demonstrating how the syndrome can lead to chronic health complications.



**Fig. 1** Percentage of long term conditions found in women with PCOS<sup>2</sup>.

Another common condition affecting women's reproductive health is endometriosis, a condition where tissue grows outside the uterus such as on the ovaries, fallopian tubes, and pelvic

---

lining<sup>3</sup>. Endometriosis can also lead to infertility and often causes significant chronic pelvic pain, as well as heavy menstrual bleeding. Similar to PCOS, endometriosis can be influenced by genetics and by other environmental factors.

Examples of other types of menstrual disorders include amenorrhea (the absence of menstruation), dysmenorrhea (painful periods), and menorrhagia (abnormally heavy periods). These can be caused by hormonal imbalances, thyroid issues, stress, and a variety of other diseases and disorders<sup>4</sup>. Some of the more serious conditions associated with women's reproductive health are cervical and ovarian cancer. There are almost half a million new cervical cancer cases annually worldwide and it can be caused by smoking, HPV infections, and other infections<sup>5</sup>. Ovarian cancer is the sixth most commonly diagnosed cancer among women in the world, and causes more deaths per year than any other cancer of the female reproductive system<sup>6</sup>. Despite this, risk factors of ovarian cancer have not been properly identified.

Though many factors are still unknown, studies point to a convergence of biological, environmental, and socioeconomic factors in the onset and progression of these diseases. It is essential to study the factors that contribute to diseases for treatment and prevention. Limited knowledge leads to delayed diagnoses, which worsens health outcomes. Some factors include genetic inheritance and family history, while others, such as environmental influences, diet, and socioeconomic status, involve epigenetic mechanisms that have been reported to increase the risk of reproductive diseases. Addressing stigma around women's reproductive health is also vital to encourage timely treatment and expand research. By examining genetic, environmental, dietary, and socioeconomic factors, we can understand how they intersect to influence disease risk.

This article explores the biological, environmental, and socioeconomic factors that contribute to increasing the risk of different reproductive diseases and conditions using a systematic literature review. First, we explore biological factors such as genetic as well as hormonal imbalances and age-related changes. Then we focus on environmental factors by analyzing how exposure to specific chemicals and pollutants as well as lifestyle choices can contribute to reproductive diseases. This connects to different socioeconomic factors that not only contribute to certain lifestyle choices but also access to healthcare, early diagnosis, treatment outcomes, and inadequate care. Traditionally, research and treatment have focused on genetic inheritance as the primary factor influencing these diseases. However, emerging evidence in the fields of epigenetics and environmental health suggests that non-genetic factors may be equally, if not more, important in disease manifestation. This paper explores the hypothesis that epigenetic, environmental, and socioeconomic influences outweigh genetic inheritance in determining women's reproductive health outcomes and aims to foster greater awareness and drive improvements in prevention, diagnosis, and

treatment of women's reproductive diseases.

### **Personal Motivation**

My interest in this topic is rooted in personal experience. I was diagnosed with PCOS and struggled with a healthcare system that provided few answers and even fewer solutions. While I was told genetics played a role, no one in my immediate family had a history of these conditions, which led me to explore other contributing factors. This search inspired a deeper investigation into the roles of environment, stress, and diet, and how these variables intersect with broader social and economic inequalities.

### **Results**

To understand the various factors that contribute to women's reproductive health risks, we must consider a wide range of influences, including genetics, lifestyle choices, environmental exposures, and more as they influence conditions like PCOS, endometriosis, menstrual disorders, and cervical and ovarian cancer, affecting both disease progression and severity.

### **Genetic Factors**

Most reproductive diseases occur due to genetic derangement. While recent advances in molecular genetics and clinical research have improved our understanding of reproductive disorders, more research is needed to identify specific genetic markers and uncover the molecular mechanisms behind these conditions. Numerous genome-wide association studies have identified loci linked to hormonal regulation, insulin resistance, and inflammatory responses<sup>7</sup>. For instance, mutations in the FSHB and LHCGR genes have been associated with altered hormone signaling in PCOS patients. However, these genetic markers often show low penetrance and variable expressivity, meaning not all individuals with these genes develop the disease.

Additionally, gene mutations are commonly associated with many disorders like hypogonadism, but the genetic basis of more common conditions like PCOS and endometriosis remains less understood. Thus, further investigation into the biological pathways affected by these genetic factors, such as hormonal imbalances, could also provide insights into disease mechanisms. Personalized treatment approaches based on genetic makeup, including gene-editing, could also offer innovative ways to reduce risks and improve outcomes for women dealing with reproductive health issues.

### **Epigenetic Factors**

While inherited genes play a key role, it is also important to examine how external factors influence gene expression through

---

epigenetic mechanisms. Epigenetics refers to changes in gene expression that do not involve alterations to the DNA sequence itself. Factors like stress, diet, and chemical exposures can cause DNA methylation or histone modification, which can “turn on” or “off” certain genes. Environmental exposures such as toxins or diet can cause epigenetic changes that influence reproductive health outcomes by modifying hormonal pathways or inflammatory responses. In endometriosis, for example, researchers have observed abnormal DNA methylation patterns in genes involved in inflammation and estrogen signaling<sup>8</sup>. Similarly, in PCOS, hypermethylation of certain metabolic genes has been documented<sup>9</sup>. These findings suggest that environmentally induced epigenetic changes can influence disease progression and severity, even among individuals with similar genetic backgrounds.

### ***Environmental Factors***

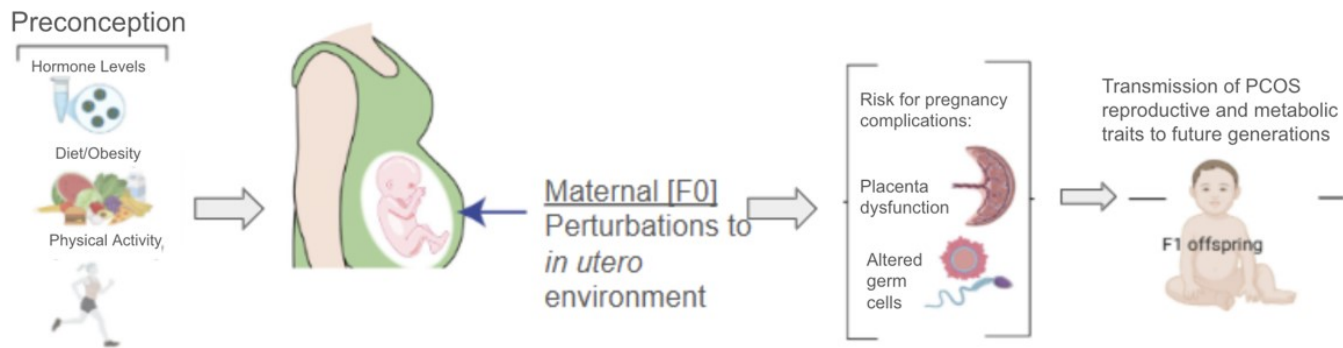
In addition to genetic and epigenetic influences, environmental exposures, especially to endocrine-disrupting chemicals, have emerged as significant contributors to reproductive health issues. Women are often exposed to these through occupational exposure or environmental contamination through food or water. These chemicals interfere with the endocrine (hormonal) system which regulates many aspects of reproductive health. Common EDCs include pesticides and chemicals such as BPA and dioxins. They have been found to interfere with hormonal systems and are linked to reduced fertility as disorders, such as PCOS and endometriosis<sup>10</sup>. Animal studies have shown that prenatal and early-life exposure to these chemicals can cause epigenetic changes that persist into adulthood<sup>11</sup>. Besides that, Human studies have also found associations between higher BPA levels and increased risk of PCOS and fibroids<sup>7</sup>. A study of almost 45,000 pairs of twins from Sweden, Denmark, and Finland found that environmental factors, rather than genetics, were the primary cause of sporadic cancers of the breast, prostate, and female reproductive system<sup>12</sup>. They can directly impact the ovary, uterus, vagina, anterior pituitary, and/or steroid production, which can lead to reproductive complications such as early puberty, infertility, abnormal cyclicality, premature ovarian failure/menopause, endometriosis, fibroids, adverse pregnancy outcomes, hormonal imbalances, and have trans-generational effects<sup>12</sup>. Additionally, Stener-Victorian et al. found that they can cross through the placenta and impact fetal hormone systems potentially causing lifelong health issues and disease susceptibility in adulthood (Figure 2). Figure 2 illustrates how these harmful exposures may trigger epigenetic modifications that are not only expressed in a developing fetus but can also be passed down to future generations, effectively transmitting reproductive disease risk through generations. This highlights the how important prenatal development and maternal health is to reduce long-term reproductive disease risk across generations. Although epigenetic modifications like DNA methylation and histone acetylation have been

implicated as mediators between environmental exposures and reproductive outcomes, the current evidence is predominantly correlative. It is important to note most studies are observational, with limited longitudinal data or experimental validation in human populations, which limits our ability to infer causality or predict specific disease outcomes from epigenetic marks.

### ***Diet***

Closely connected to environmental influences is diet, which plays an often-underestimated role in shaping reproductive health outcomes. While obesity contributes to reproductive issues, poor dietary habits often worsen these conditions, creating a dangerous cycle. Current literature shows that dietary interventions can be beneficial. Studies have demonstrated that high-protein diets can improve menstrual regularity and lower androgen levels in women with PCOS<sup>14</sup>. It has also been found that larger portion sizes and poor dietary choices, such as relying on energy-dense meals instead of unprocessed grains, fruits, and vegetables can worsen metabolic and hormonal imbalances<sup>15</sup>. In women with PCOS, these imbalances often involve abnormal hormone levels and increased production of male hormones, influenced by high insulin levels, regardless of body weight. These changes increase the risk of other disorders such as metabolic syndrome, type 2 diabetes, and infertility.

Ketogenic diets specifically have been found to promote weight loss and more regular menstrual cycles<sup>16</sup>. While many dietary approaches may influence reproductive health, this paper focuses on the ketogenic diet due to its emerging relevance in recent studies related to PCOS and hormonal balance. This narrower focus allows for a more in-depth analysis without overextending the scope of the review. Ketogenic diets are high in fats and complex carbohydrates and low in simple carbohydrates. In a cross-sectional study, testosterone levels in women with PCOS were found to be significantly lower in those who consumed more protein, complex carbohydrates, and fiber, and who consumed fewer simple carbohydrates, and saturated fats than in those who did not follow this diet<sup>16</sup>. This helps restore hormonal imbalances which in turn can restore menstrual cycles and reduce the symptoms and side effects of PCOS. In another study conducted in Ohio, 30 women with PCOS followed a ketogenic diet for at least 3 months. The study found that approximately 92% of the women who had irregular menstrual cycles had their regular cycle return after 6 months, and all women had their cycle become regular after 15 months<sup>17</sup>. Additionally, ketogenic diets have shown promise in cancer treatment such as with ovarian and cervical cancer<sup>18</sup>. In preclinical studies, ketogenic diets slowed tumor growth, prolonged survival rate, and delayed the growth of new tumors<sup>2</sup>. While multiple studies suggest ketogenic diets may improve PCOS symptoms, it is important to note that sample sizes have generally been small, and findings are preliminary<sup>18</sup>. Larger randomized controlled



**Fig. 2** Epigenetic transmission of reproductive disease risk through the placenta across generations<sup>13</sup>.

trials are necessary to confirm these effects.

### Biological Factors

Beyond diet and external exposures, biological processes, particularly hormonal regulation, form the foundation of reproductive health. Hormonal imbalances can greatly increase the risk of various reproductive diseases. They can be caused by factors such as stress, exposure to EDCs, a poor diet, autoimmune conditions, hormone-related conditions, or damage to the endocrine glands<sup>19</sup>. Even slight changes in hormone levels can cause significant changes to the body. Not only are women more prone to these hormonal imbalances than men are, but variations in hormones are often present during menstruation, pregnancy, and menopause<sup>20</sup>. Estrogen affects various bodily systems such as the reproductive, endocrine, nervous, and immune systems and is mediated by different receptors. These receptors include the nuclear receptor family which are estrogen receptors and membrane estrogen receptors<sup>21</sup>. Abnormal functions of these receptors have been linked to conditions such as infertility, endometriosis, PCOS, and cancers<sup>21</sup>. Elevated estrogen levels can specifically be caused by changes in eating patterns as well as an increase in the conversion of testosterone to estrogen<sup>20</sup>.

### Social Disparities

Finally, even with all biological, genetic, and lifestyle factors considered, social determinants of health exert a big influence on reproductive outcomes. Social disparities can significantly affect women's reproductive health, particularly for women of color. For example, factors like limited access to healthcare, lack of insurance, and fewer educational opportunities can make it harder for women of color to receive proper care. On top of that, racial bias from healthcare providers can lead to worse treatment and outcomes for Black and Hispanic women. M. Cohen et al. found that age-specific incidence rates of cervical adenocarcinoma (ADC) vary significantly by race and ethnicity,

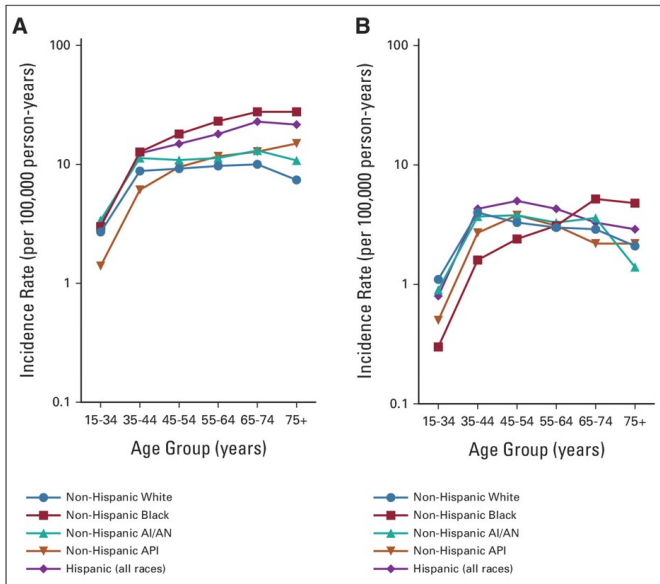
even after correcting for hysterectomy (surgical procedure to remove a woman's uterus) prevalence (Figure 3). The figure demonstrates that Black and Hispanic women continue to experience disproportionately higher rates of certain cervical cancer subtypes compared to white women, highlighting persistent racial disparities in incidence across histologic subtypes despite advances in prevention and screening. This trend of disparities continues in other areas, such as a study showing that Black and Hispanic women account for 75% of new HIV diagnoses<sup>22</sup>. Black and Latina women in the U.S. are disproportionately affected by uterine fibroids and often receive more invasive treatments such as hysterectomy, reflecting systemic inequities in medical care<sup>23</sup>. Chronic stress associated with discrimination and economic hardship may also trigger epigenetic changes, further compounding disease risk.

In addition, reproductive health outcomes remain worse for women of color, with Black women facing significantly higher infant mortality rates compared to European American women—about 8 more deaths per 1,000 live births<sup>24</sup>. Moreover, research has shown that nearly half of the deaths in the Black population up to age 70 could have been prevented with better access to healthcare and treatment<sup>25</sup>. These examples show how social disparities have deep, long-lasting impacts on the reproductive health of women of color.

## Methodology

### Search strategy

The methodology for this study primarily consisted of a systematic literature review using google scholar, synthesizing data from many peer-reviewed research articles, clinical studies, and reviews to explore reproductive diseases and the various factors contributing to their development. The research primarily focused on studies concerning women of reproductive age, particularly those diagnosed with conditions such as PCOS, en-



**Fig. 3** Age-specific incidence rates of cervical adenocarcinoma (ADC) expressed per 100,000 person-years by race and ethnicity for (A) cervical SCC and (B) ADC subtypes, corrected for hysterectomy prevalence among women in the United States aged 15 to 75+ years<sup>26</sup>.

dometriosis, and ovarian cancer. Data was carefully collected from sources that examined genetic, hormonal, dietary, and environmental variables and their effects on reproductive health. The search strategy involved the use of key terms such as Reproductive Health, Menstrual, Environment, Diet, Epigenetics, and PCOS to identify relevant studies. These keywords were used in google scholar to ensure a comprehensive and broad search for articles relevant to the topic of reproductive diseases and the factors that influence them.

### Inclusion Criteria

Studies included in the review focused on women of reproductive age diagnosed with reproductive diseases such as PCOS, endometriosis, or ovarian cancer. They also investigated the impact of biological (genetic and hormonal), environmental (pollutants, chemicals, and lifestyle factors), or socioeconomic variables (healthcare access, education, and socioeconomic status) on reproductive health outcomes. Additionally, only peer-reviewed articles published in the last 25 years were considered to ensure the review included the most up-to-date research.

### Data Extraction

Data was extracted from the selected studies to capture details including study design, participant demographics, sample size, outcomes assessed, and key findings related to the factors influencing reproductive health. Each study was carefully reviewed

to identify the specific factors examined and how they impacted reproductive diseases.

### Synthesis Method

The data was synthesized through a qualitative approach, where findings from the selected studies were grouped based on themes, such as genetic factors, environmental exposures, and socioeconomic influences. Comparisons were made across studies to assess the consistency of findings and the strength of evidence supporting each factor's role in reproductive health outcomes. This allowed for the identification of key patterns and insights into how these factors interact to influence reproductive diseases.

### Quality Assessment

Each study was assessed for factors such as sample size, study design, risk of bias, and the reliability of their findings. This process ensured that only high-quality studies were included in the final synthesis, enhancing the overall credibility and reliability of the review's conclusions. This review followed a systematic protocol utilizing the PRISMA guidelines. Google scholar was searched using predefined keywords. Inclusion criteria encompassed peer-reviewed studies from 2000–2025 focusing on genetic, environmental, and socioeconomic factors influencing women's reproductive diseases. Quality of studies was assessed using the Newcastle-Ottawa Scale to ensure methodological rigor.

### Limitations

The study acknowledges limitations due to the reliance on existing literature, which may not fully capture every possible factor contributing to reproductive diseases. It is important to note that many dietary intervention studies rely on self-reported adherence and short-term follow-up, limiting their generalizability. Similarly, preclinical findings on ketogenic diets and cancer require validation in clinical settings. Despite the studies reviewed, significant gaps remain, especially in understanding how genetic predispositions interact with modifiable environmental and socioeconomic factors over the life course. Few studies have adopted a multi-factorial approach incorporating genetics, epigenetics, environment, and social determinants simultaneously, which limits the development of comprehensive prevention strategies.

Future research should prioritize longitudinal studies that examine how early-life exposures and chronic stress shape reproductive health across the lifespan, with particular attention to marginalized populations. It should expand on these findings and include more diverse populations and focus on further exploring the genetic and molecular mechanisms behind these disorders, as little is currently known about them. Personalized

medicine treatments based on genetic history and lifestyle factors, along with early intervention, can help treat and reduce the symptoms of these diseases. Targeted interventions that consider individual patient profiles, including hormone levels, genetic makeup, and lifestyle factors, could offer more precise and effective treatments.

## Discussion

In conclusion, women's reproductive health is shaped by a variety of factors, including genetics, environmental influences, and socioeconomic conditions. Conditions such as PCOS, endometriosis, menstrual disorders, and cancers of the reproductive tract are affected by hormonal imbalances, exposure to environmental toxins, and lifestyle choices, either causing these conditions or worsening their symptoms and leading to more severe outcomes. This review aimed to find which among genetic, environmental, dietary, and socioeconomic factors most significantly contribute to the risk of women's reproductive diseases, and how these factors interact. While this paper examines genetic, environmental, and socioeconomic factors individually, it is important to acknowledge that these categories often interact in complex ways. For example, a genetic predisposition to reproductive disease may be amplified by environmental exposures such as endocrine-disrupting chemicals or shaped by socioeconomic factors like access to healthcare and nutrition. Although this review does not explore these interactions in depth, future research should investigate how these overlapping influences jointly contribute to reproductive health outcomes.

While genetics provide a foundation for understanding women's reproductive diseases, they represent only a portion of a far more complex picture. Epigenetic modifications, environmental exposures, diet, lifestyle, and socioeconomic status interact to influence disease onset, severity, and progression. Among examined factors, environmental exposures and socioeconomic conditions show the strongest evidence for modifiable impact on reproductive health, suggesting healthcare priorities should emphasize reducing toxin exposure and improving nutrition access alongside genetic risk assessment. Recognizing the complex nature of these diseases is essential for developing more holistic and equitable approaches to prevention and treatment. However, fully addressing this complexity requires more comprehensive data.

Additionally, the development of safer alternatives to current therapies like birth control, which can have harmful side effects, is crucial for improving patient outcomes. Birth control is often used as a way to regulate irregular menstrual cycles which can restore ovulation and reduce the side effects of conditions such as PCOS. However, the medicine itself has many possible harmful side effects. Studies have found that these side effects are what deter 40% women from taking birth control as they were concerned about blood clots, weight gain, irregular bleeding,

mood changes, and acne<sup>27</sup>. This highlights the need for the development of safer medication that women can be certain about. However, medication alone cannot resolve the broader challenges many women face.

Addressing social disparities such as limited access to healthcare, racial bias, and socioeconomic challenges is essential for improving reproductive health outcomes, particularly for women of color. During the pandemic, the Administration and Congress worked to expand health coverage, including a temporary Medicaid enrollment requirement that ended in March 2023, leading to millions of disenrollments<sup>28</sup>. The Administration also focused on reducing maternal health disparities and improving racial and ethnic data to better address health inequities by increasing access to health coverage. Ensuring equitable healthcare access, removing racial bias from medical systems, and tackling the root causes of social inequalities can significantly improve women's reproductive health on a global scale. It is important that future efforts focus on a holistic approach that combines medical advances, social reform, and a personalized approach to treatment in order to achieve better health outcomes for all women.

## References

- 1 N. Ajmal, S. Khan and R. Shaikh, *Polycystic ovary syndrome (PCOS) and genetic predisposition: A review article*.
- 2 D. Weber, S. Aminzadeh-Gohari, J. Tulipan, L. Catalano, R. Feichtinger and B. Kofler, *Ketogenic diet in the treatment of cancer – where do we stand?*
- 3 G. Hudelist, N. Fritzer, A. Thomas, C. Niehues, P. Oppelt, D. Haas, A. Tamma and H. Salzer, *Diagnostic delay for endometriosis in Austria and Germany: causes and possible consequences*.
- 4 M. Begum, S. Das and H. Sharma, *Menstrual disorders: Causes and natural remedies*.
- 5 E. DrPhA and N. PhDb, *D.Saslow PhDc, The epidemiology of cervical cancer*.
- 6 J. Permuth-Wey and T. Sellers, *Epidemiology of ovarian cancer*.
- 7 T. Takeuchi, O. Tsutsumi, Y. Ikezuki, Y. Takai and Y. Taketani, *Positive relationship between androgen and the endocrine disruptor, bisphenol A, in normal women and women with ovarian dysfunction*.
- 8 S. Guo, *Epigenetics of endometriosis*.
- 9 N. Mimouni, I. Paiva, A. Barbotin, F. Timzoura, D. Plassard, S. Gras, G. Ternier, P. Pigny, S. Catteau-Jonard, V. Simon, V. Prevot, A. Boutillier and P. Giacobini, *Polycystic ovary syndrome is transmitted via a transgenerational epigenetic process*.
- 10 D. Caserta, A. Mantovani, R. Marci, A. Fazi, F. Ciardo, C. Rocca, F. Maranghi and M. Moscarini, *Environment and women's reproductive health*.
- 11 M. Laws, A. Neff, E. Brehm, G. Warner and J. Flaws, *Endocrine disrupting chemicals and reproductive disorders in women, men, and animal models*.

- 
- 12 A. Gore, V. Chappell, S. Fenton, J. Flaws, A. Nadal, G. Prins, J. Toppari and R. Zoeller, *EDC-2: The Endocrine Society's second scientific statement on endocrine-disrupting chemicals*.
  - 13 E. Stener-Victorin and Q. Deng, *Epigenetic inheritance of PCOS by developmental programming and germline transmission*.
  - 14 X. Ma, L. Wu, Y. Wang, S. Han, M. El-Dalatony, F. Feng, Z. Tao, L. Yu and Y. Wang, *Diet and human reproductive system: Insight of omics approaches*.
  - 15 E. Diamanti-Kandarakis, H. Kandarakis and R. Legro, *The role of genes and environment in the etiology of PCOS*.
  - 16 R. Kudesia, M. Alexander, M. Gulati, A. Kennard and M. Tollefson, *Dietary Approaches to Women's Sexual and Reproductive Health*.
  - 17 Y. Tsushima, N. Nachawi, K. Pantalone, M. Griebel and U. Alwahab, *Ketogenic diet improves fertility in patients with polycystic ovary syndrome: A brief report*.
  - 18 E. Camajani, A. Feraco, L. Verde, E. Moriconi, M. Marchetti, A. Colao, M. Caprio, G. Muscogiuri and L. Barrea, *Ketogenic diet as a possible non-pharmacological therapy in main endocrine diseases of the female reproductive system: A practical guide for nutritionists*.
  - 19 H. Yoshimura, *Balancing hormones in younger women: A comprehensive guide to hormonal health*.
  - 20 J. Roop, *Hormone imbalance—a cause for concern in women*.
  - 21 Z. Tang, R. Zhang, Z. Lian, S. Deng and K. Yu, *Estrogen-receptor expression and function in female reproductive disease*.
  - 22 M. Y. MD, N. F. MPH, R. M. PharmD and H. MD, *Racial and ethnic disparities in reproductive health services and outcomes*.
  - 23 H. Eltoukhi, M. Modi, M. Weston, A. Armstrong and E. Stewart, *The health disparities of uterine fibroid tumors for African American women: a public health issue*.
  - 24 P. Braveman, *Health disparities and health equity: Concepts and measurement*.
  - 25 R. WJ, *Health disparities: gaps in access, quality and affordability of medical care*.
  - 26 C. Cohen, N. Wentzensen, P. Castle, M. Schiffman, R. Zuna, R. Arend and M. Clarke, *Racial and Ethnic Disparities in Cervical Cancer Incidence*.
  - 27 S. Kingsberg, J. Loving, H. Alex, B. Bernick and S. Graham, *Women and Healthcare Professionals' Understanding of their Concerns of Birth Control Side Effects*.
  - 28 N. Ndugga, D. Pillai and S. Artiga, *Disparities in health and health care: 5 key questions and answers*.