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Gender Disparity in Authorship in High-Impact Obstetrics and Gynecology Journals over Twenty Years

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ABSTRACT

In the present study, we evaluate the proportion of women authorship in the field of obstetrics and gynecology research by assessing five prominent journals spanning 2001–2021, analyzing article types, study types, sub-specificities, and regions. Our outcomes demonstrate a significant increase in women's authorship over time, highlighting progress in promoting gender equality. However, the rate of first and most senior women authors remains relatively unchanged. Notably, we determine a rise in the proportion of first authors who are women in experimental studies but not in studies that require surgical practice. This study sheds light on the challenges faced by women in scientific pursuits. Our study suggests that systemic barriers, prejudices, and inequalities likely continue to hinder gender equality in our discipline. By emphasizing the continuance of this problem, we intend to encourage collective awareness and action. Together, we can transcend gender disparities and create a space where every voice, regardless of gender, can flourish. Through our study, we hope to inspire future generations and ignite change within the field of obstetrics and gynecology. By valuing and amplifying diverse perspectives, we can create a future where gender equality is the norm, enabling scientific discovery to reach new heights.

ARTICLE HISTORY

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KEYWORDS

Authorship; gender; equality; impact factor; journal; obstetrics and gynecology

Introduction

Gender bias and discrimination remain obstacles for women in gaining an equal role in many medical professions. Today, the number of women working in the health industry is increasing rapidly, and in countries of the global North, almost one in four professional healthcare providers are women (American Urological Association 2019). Nonetheless, even here, women are paid less than men for equal work and work in lower status positions than men. Additionally, women are less able to get promoted due to a lack of women mentors and due to prejudices that question women's surgical capability (Rohde, Wolf, and Adams 2016). Moreover, women face insufficient funding for their research and receive less sponsorship than their male counterparts (Myers et al. 2018).

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Despite the increasing number of women healthcare workers globally, research suggests that studies conducted by women receive inadequate recognition and publication opportunity, potentially hindering their participation in scientific research activities, such as speaking at scientific congresses and publishing articles (Giannos et al. 2023) crucial for academic career advancement and obtaining grants. Whitley and colleagues investigated the proportion of women authors in urology and found that the rate of articles with women as first author increased from 21.4%–30.0% between 2014 and 2018 (Whitley et al. 2021). Similarly, Filorda et al. analyzed articles from six journals with the highest impact factors in medicine, with the finding that 27% of all authors were women in 1994 and 37% were women in 2014 (Filardo et al. 2016).

Although previous papers analyzed the contribution of women authors to scientific writing in different medical disciplines, to our knowledge, a limited number of studies have evaluated the rate of women authors in obstetrics and gynecology – the one medical discipline in which women’s participation has been historically the highest. In the present study, we aimed to elucidate the proportion of women authors in the obstetrics and gynecology literature by analyzing five journals with the highest impact in obstetrics and gynecology. The importance of this question lies in highlighting the issue of gender disparity in the field of obstetrics and gynecology – the very medical discipline which historically has had the highest rate of women’s participation (Moore 2023). By examining the representation of women authors, the study aims to shed light on the progress made in promoting gender equality in academic publishing. It also aims to address potential barriers and challenges that women may face in achieving recognition and opportunities in scientific activities, if any.

Material and Method

The present study was performed between 1 September 2022 and 15 September 2022. Two gynecologists with >10 years of experience reviewed five journals with the highest impact factors in the obstetrics and gynecology field, available in 2001 and 2021. The objective of the study was to examine changes that occurred over the past two decades. As the process of publishing accepted articles can take up to two years, the search and analysis were completed in 2021 to ensure the inclusion of the most recent data available. The selected journals were *Human Reproduction Update*, *Ultrasound in Obstetrics and Gynecology*, *American Journal of Obstetrics and Gynecology*, and *BJOG: An International Journal of Obstetrics and Gynecology*, and *Human Reproduction*. The authorships of the journals were analyzed during the review. As all articles published before 2001 were not online, 2001 was selected as the starting point. If the journal was in the top five journals with the highest impact factor in 2021 but was not published in 2001, the journal was excluded from the study. Additionally, we only included original articles, meta-analyses, and reviews, while papers including author responses, case reports, editorial comments, and letters to the editor were excluded.

Article type (original articles and meta-analysis or review) and study type (clinical or experimental) were recorded during the review. The number of papers with all-women authorship, women as first authors, or women as senior author (generally the last author position) were noted. If the gender of the author could not be precisely

determined, a web search was performed, including institutional webpages, websites holding academic data, and personal websites to clarify gender. Authors with uncertain gender were excluded from the study. In single-author studies, the author was recorded as the first author. Lastly, papers were classified into sub-specificities (gynecology, oncology, obstetrics, infertility, and urogynecology) and regions (America, Europe, and others).

Initially, we compared the rate of all female authorships and the proportion of first and senior women authors in studies between 2001 and 2021. Additionally, we analyzed the proportion of women authors and female first author rate regarding article type, study type, sub-specificity and region between 2001 and 2021.

Statistical Analysis

Statistical analyses were performed using Excel Version 16 (Microsoft Corporation, USA). Female author rates are shown as n (%). Graphs containing the number of female writers were created comparatively by journal, article type, and region.

Results

The impact factors of journals are presented in Table 1. In total, 201 papers from 2001 and 239 papers from 2021 were enrolled in the study. The proportion of first authors who were women was 16.4% in 2001 and 22.2% in 2021, and the rate of senior women authors was 10.4% in 2001 and 14.6% in 2021 (Figure 1). However, women's authorship increased from 2001–2021 (22.2% and 27.7%) (Figure 2).

The change in the proportion of articles with women as first authors over the years is shown in Figure 3. The women authors rate in *BJOG*, which was 22% in 2001, decreasing to 12% in 2021. In the other 4 journals, the rate of articles with women as first authors increased in 2021 compared to 2001. There was an increase in the rates of women authors in 2021 compared to 2001 in all subcategories according to article types, study types, and region. According to the subspecialty, an increase was observed in gynecology, obstetrics, and infertility in 2021. In the field of urogynecology, the rate of women authors was higher in 2001 than in 2021 (Figure 4).

The distribution of articles containing women authors by year is shown in Figure 5. In all journals except *BJOG*, the rate of women authors is calculated to be higher in 2021 compared to 2001. The rate of women authors in all subcategories of article types and study types increased in 2021 relative to 2001. Similarly, the rates of women authors increased in all subspecialty categories over the past 20 years (Figure 6).

Table 1. Characteristics of the top 5 journals evaluated.

No	Journal	H index	Impact Factor (2021)	Number of articles	
				2001	2021
1	Human Reproduction Update	190	15.61	58	47
2	Ultrasound in Obstetrics and Gynecology	151	7.29	16	26
3	American Journal of Obstetrics and Gynecology	235	8.66	56	90
4	BJOG: An International Journal of Obstetrics and Gynecology	170	3.139	42	63
5	Human Reproduction	231	6.918	29	13

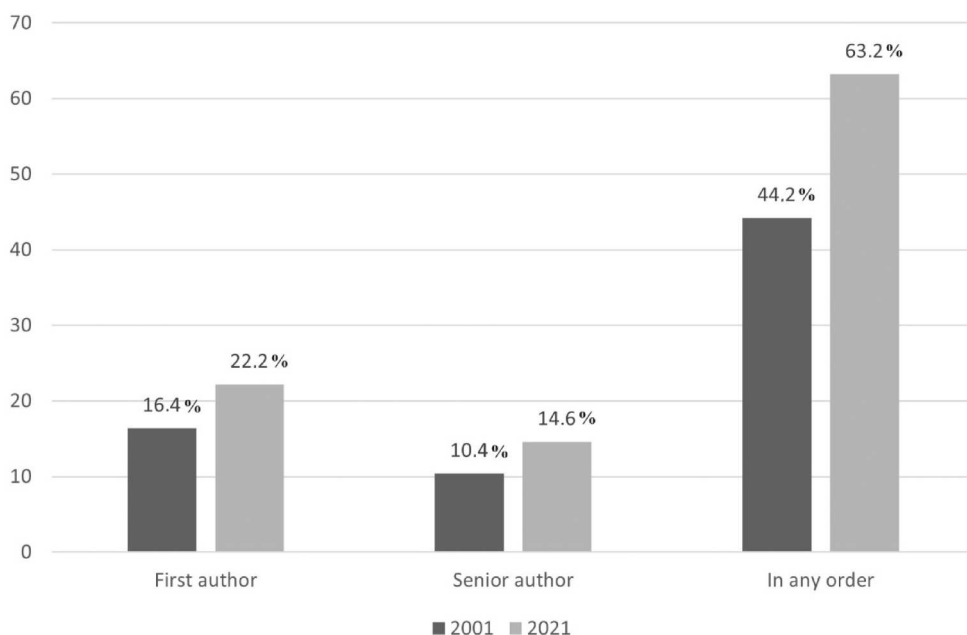


Figure 1. Overall female authorship.

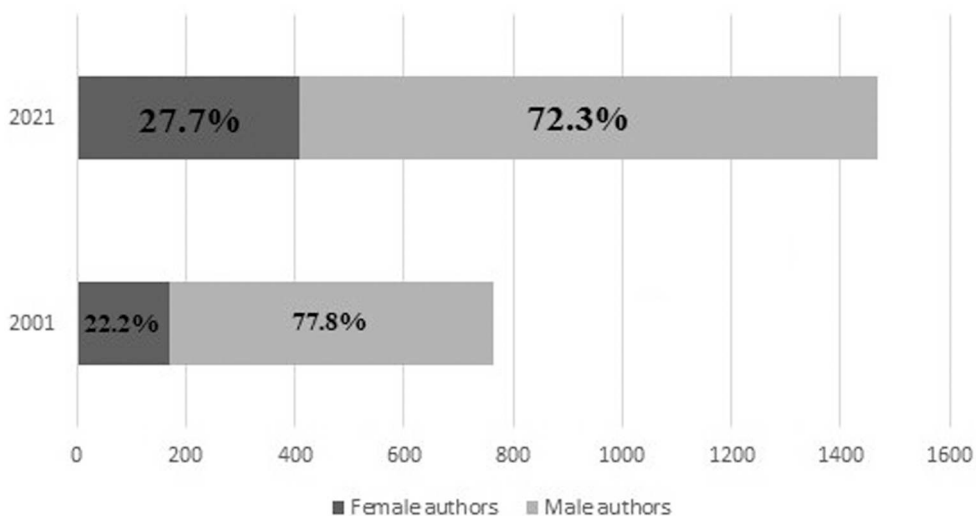


Figure 2. Evaluation of the rate of the total number of female authors and the total number of authors by year.

Discussion

Providing equal opportunities for women in working life and social fields is one of the most important social justice goals of this century. We believe that rather than ignoring the problems, examining an issue from all its aspects is the first step in producing solutions, and with this aim, our research sought to evaluate the proportion of women

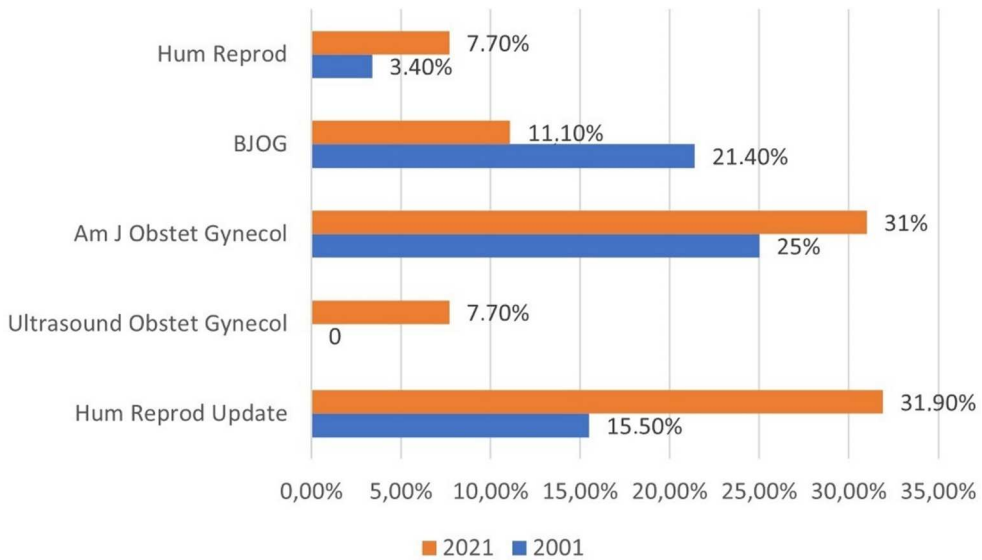


Figure 3. Comparison of articles with female first authors by years.

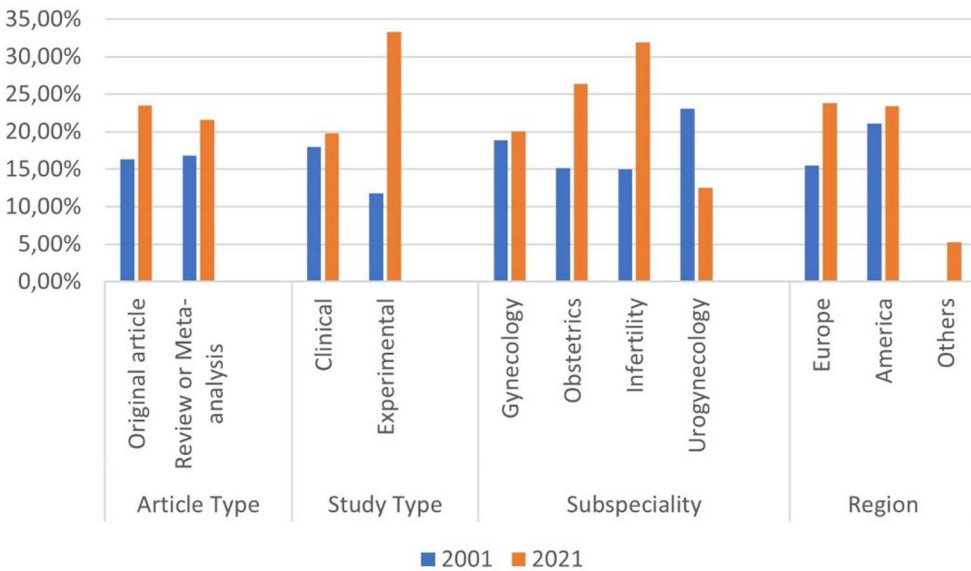


Figure 4. Comparison of articles with female first authors according to years and article characteristics.

authors in top-tier obstetrics and gynecology literature. We found significant increases in the proportion of women authors in any order from 2001–2021, but not for the rates of first and most senior women authors (often signified by their positioning as last author). The proportion of women authors increased dramatically in review and meta-analysis, clinical and experimental studies, articles about infertility, and articles from Europe. Additionally, the rate of first authors who were women particularly increased in experimental studies and articles about infertility.

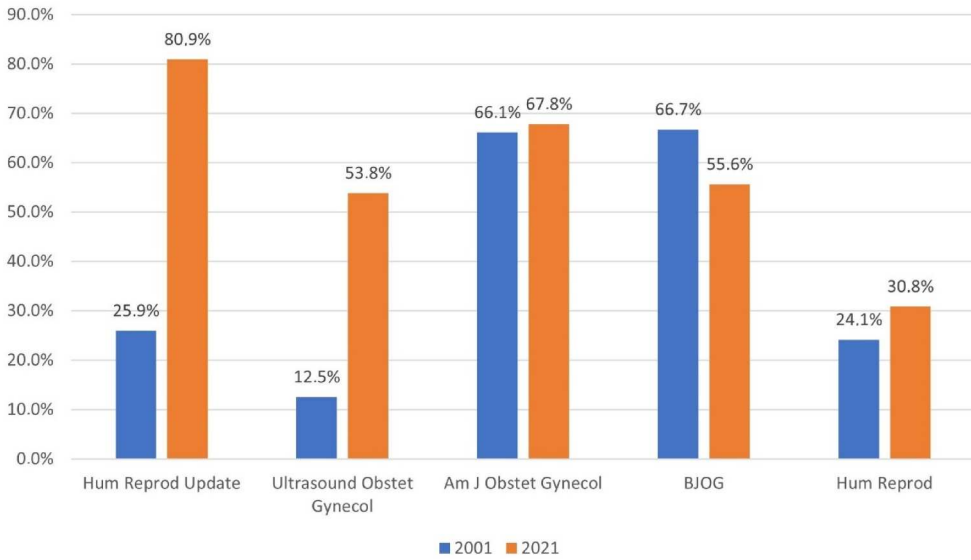


Figure 5. Comparison of articles with any female authors by year.

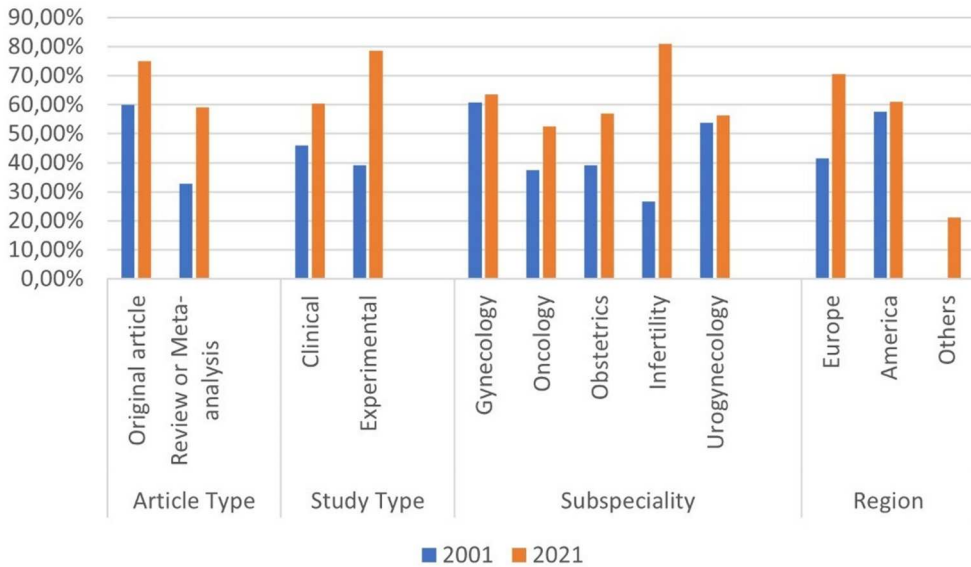


Figure 6. Comparison of articles with female authors in any order according to years and article characteristics.

The present study showed that the proportion of female authors significantly increased from 2001–2021, but the rate of first and senior female authors did not change. Previous studies have demonstrated that women are underrated in scientific papers compared to men, especially in the surgical disciplines (Penny et al. 2014; “The State of Women in Academic Medicine” 2023). However, this situation has changed over the years. Xu and colleagues investigated authorship trends in hand surgery papers, finding that the

proportion of female authors increased from 13.4% in 2006–19.9% in 2019 (Xu et al. 2022). Similarly, Aslan et al. demonstrated a significant increase in female author rates in neurosurgery journals between 2003 and 2018 (12% vs. 16.5%, $p < 0.01$) (Aslan et al. 2020). The reason why the number of senior women authors did not increase may be related to the fact that the number of women in management-level positions is not yet at the desired level.

The first author is usually the researcher with the most noteworthy intellectual contribution to the study. In the present study, we found significant growth in women first-authors only in experimental studies and papers about infertility. Weiss et al. investigated the rate of first authors who were women in urology practice and found that only 2% of the first authors were women in 1974, and 16.4% in 2009 (Weiss, Kovshilovskaya, and Breyer 2012). In another study, Amering and colleagues analyzed the contribution of women as first authors in high-impact psychiatry journals, finding a 17.1% female first author rate in 1994 and a 35.3% in 2007 (Amering, Schrank, and Sibitz 2011). In obstetrics and gynecology practice, these results also demonstrate that women still do not have sufficient opportunities in clinical research in areas such as oncology, obstetrics, and urogynecology, where surgical procedures are more common.

A limited number of studies investigated women's inequality according to the article and study type. According to the present study, the percentage of female authors was significantly higher in 2021 in review and meta-analysis, clinical and experimental studies, but not in original study articles. Vranas and colleagues reviewed papers from 40 high-impact journals from 2008–2018, and the authors showed that the proportion of women authors was significantly higher in basic science studies than in clinical studies (Vranas et al. 2020). In another study, Nkenke et al. evaluated papers on oral and maxillofacial surgery and stated that the proportion of women authors was high only for case reports and technical notes but not for original articles between 1980 and 2010 (Nkenke et al. 2015).

The socio-economic development level of specific global regions can affect the position of women in the health industry. In the present study, only European women authors had a significant increase. Pinho – Gomes et al. analyzed gender distribution in studies about the COVID-19 pandemic globally, finding the lowest rate of women authors in Africa and the highest rate in Oceania (Pinho-Gomes et al. 2020). In another study, Vranas and colleagues evaluated regional impacts on women's authorship; the highest proportion of women authors was found in Europe and New Zealand, and the lowest was found in Asia (Nkenke et al. 2015).

The gender disparity in gynecology practice is not only limited to authorship. Women are also underrepresented in leadership roles and academic titles within academic institutions, including gynecology and other medical disciplines. Female gynecologists were less likely to hold academic appointments and senior leadership positions than their male counterparts (Cheng, Javorsky, and Kimball 2013; James and Brower 2022). Gender representation gaps extend beyond practice to the recognition and accolades women receive. According to a study by Burns et al., men are more likely to receive prestigious awards, honours, and chair positions than women in obstetrics and gynecology (Burns et al. 2023). And a recent study analyzing the gender-based incomes in New Zealand universities from 2006–2018 found that while the gender gaps in age and research performance score have narrowed by years, the gaps in payments have not (Brower and James 2023).

The present study has limitations, including the probability of gender and publication type misclassification. Gender determination was made by visiting institution websites, social media accounts (such as LinkedIn), and internet search engines (such as Google). In addition, the gender identity declared by the author themselves has been taken into account. Two experienced gynecologists reviewed the papers to avoid misclassification and the study was excluded if the gender of the authors was not determinable. This approach may have resulted in overlooking transgender and non-binary researchers, which further research might elucidate. Also, this study did not focus on the academic careers of authors, which may be a fruitful subject of further inquiry. Lastly, while the study included two decades, the increase or decrease in female authorships within specific years may have been overlooked.

Conclusion

The present study found that the proportion of women's authorships, but not the rate of first and most senior women authors, significantly increased from 2001–2021 in obstetrics and gynecology. Furthermore, our findings indicate a significant increase in the rate of women as first authors, particularly in experimental studies and articles focused on infertility. Additionally, there was a substantial rise in the proportion of women authors across various categories, including review and meta-analysis, clinical and experimental studies, articles related to infertility, and articles originating from Europe. These results draw attention to the gender disparity that continues to exist within the academic field of gynecology, particularly in studies that require clinical practice and surgical expertise. By shedding light on these trends, our study emphasises the importance of addressing gender disparities and promoting equal opportunities for women in all geographic eras in academic research, clinical practice, and surgical disciplines within gynecology.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Bahar Yuksel Ozgor is an accomplished Obstetrics and Gynecology specialist in Turkey with extensive expertise in fertility care and gynecologic endoscopic surgeries. She pursued her medical degree at Istanbul University, completed her residency at the same institution, and later conducted research at Stanford University and gained experience in urogynecology at Kings College London. Driven by a passion for reproductive endocrinology and infertility, she has become an accredited Endometriosis Specialist and is currently pursuing a doctorate in Biomedical Engineering at Bogazici University. She co-founded the Endometriosis Research and Support Society (Endoturkiye) in Turkey to advocate for early diagnosis and raise awareness of endometriosis. Throughout her multifaceted roles as a clinician, surgeon, and research scientist, she consistently seeks evidence-based approaches to enhance treatment outcomes and discover novel therapeutic options.

Aslihan Ergul is a highly accomplished Obstetrics and Gynecology specialist known for her expertise and dedication to women's health, with a strong academic background and extensive clinical experience. She has earned her medical degree from Cerrahpasa School of Medicine in Istanbul, Turkey, and completed her residency, consistently demonstrating exceptional capabilities and a

passion for providing the highest standard of care to her patients. As a compassionate and skilled practitioner, she specializes in various aspects of women's health and strives to stay updated with the latest advancements in her field, incorporating evidence-based practices into her patient care. Beyond her clinical work, she actively engages in research and scholarly activities to contribute to the advancement of medical knowledge, with a keen interest in exploring innovative treatment options and improving patient outcomes. Her dedication to research and evidence-based medicine reflects her commitment to providing the best possible care to her patients.

Ezgi Gizem Berkay is a distinguished geneticist with both an MD and a PhD, showcasing her extensive expertise in the field of medicine and genetics. In addition to her medical and scientific qualifications, she holds a degree in history, reflecting her diverse intellectual interests. She has authored several publications, contributing valuable insights to genetic research. Beyond her academic pursuits, she is actively involved in advocating for women's rights, demonstrating her commitment to social justice and empowerment. Her multifaceted background and dedication make her a prominent figure in both the scientific community and the realm of activism.

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