

Access this article online
Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_925_23

# Exploring the urgent need for an online reproductive health education program for infertile couples: A qualitative study

Azam Hamidzadeh<sup>1</sup>, Afsaneh Keramat<sup>2</sup>, Tahereh NaseriBooriAbadi<sup>3</sup>, Reza Chaman<sup>4</sup>, Naser Mogharabian<sup>5</sup>, Zeinab Rabiei<sup>6</sup>, Shahrbanoo Salehin<sup>7</sup>

<sup>1</sup>Student Research Committee, School of Nursing and Midwifery, Shahroud University of Medical Sciences, Shahroud, Iran, <sup>2</sup>School of Nursing and Midwifery, Shahroud University of Medical Sciences, Shahroud, Iran, <sup>3</sup>Department of Health Information Technology, School of Allied Medical Sciences, Shahroud University of Medical Sciences, Shahroud, Iran, <sup>4</sup>Department of Epidemiology, Center for Health Related Social and Behavioral Sciences Research, Shahroud University of Medical Sciences, Shahroud, Iran, <sup>5</sup>Sexual Health and Fertility Research Center, Shahroud University of Medical Sciences, Shahroud, Iran, <sup>6</sup>Department of Midwifery, School of Nursing and Midwifery, Bushehr University of Medical Sciences, Bushehr, Iran, <sup>7</sup>Reproductive Studies and Women's Health Research Center, Shahroud University of Medical Sciences, Shahroud, Iran

## Address for correspondence:

Dr. Shahrbanoo Salehin,  
7 Tir Square, Shahroud  
University of Medical  
Science, Shahroud, Iran.  
E-mail: shahrbanooalehin  
1352@yahoo.com

Received: 28-06-2023  
Accepted: 23-08-2023  
Published: 29-08-2024

## Abstract:

**BACKGROUND:** With the escalating utilization of online health education programs and the growing prevalence of infertility, there is an urgent requirement for a comprehensive and effective online platform that caters to the unique needs of couples facing infertility. This study aims to investigate and understand the needs and potential benefits of implementing an online reproductive health education program for infertile couples.

**MATERIALS AND METHODS:** This research was a qualitative study conducted in Shahroud City, Iran from May 2022 to June 2022. Sixteen semi-structured interviews were conducted with infertile people and key informants. Sampling method used in this study was purpose-based with maximum variety. All interviews were digitally recorded and transcribed verbatim in Persian and analyzed using conventional content analysis approach. MAXQDA software version 12 was used to facilitate data analysis.

**RESULTS:** From the data analysis, 2 themes, 3 main categories, and 16 subcategories emerged. The themes included "Reproductive Health Education Needs" and "Preferences for Internet-based Reproductive Health Education and Support." The first theme consisted 2 categories Reproductive health literacy and Emotional and Psychological Support. The second theme included one category: Technical and Logistical Considerations.

**CONCLUSION:** The data analysis of this study has revealed significant insights into the needs and preferences of infertile couples regarding Internet-based reproductive health education and support. These findings provide valuable guidance for the development and implementation of Internet-based reproductive health education programs tailored to the specific needs of infertile couples.

## Keywords:

Education, infertility, Internet-based intervention, qualitative research, reproductive health

## Introduction

The key to designing effective educational interventions is understanding the educational needs of the target community, in this case, infertile couples.<sup>[1]</sup>

An Internet-based reproductive health education program conforming to the specific needs and preferences of infertile

couples provides a unique opportunity for them.<sup>[2]</sup>

The program's structure should be designed to provide a comprehensive and personalized learning experience and adopt modern technologies to increase accessibility, flexibility, and interaction. This approach can improve couples' knowledge, decision-making, and coping

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Hamidzadeh A, Keramat A, NaseriBooriAbadi T, Chaman R, Mogharabian N, Rabiei Z, *et al.* Exploring the urgent need for an online reproductive health education program for infertile couples: A qualitative study. J Edu Health Promot 2024;13:289.

skills and, finally, help their well-being and success in treatment.<sup>[3]</sup>

Internet-based reproductive health education programs have shown promise in reaching a broad audience and providing critical information and support. However, further research is needed to fully understand their structure and effectiveness. Gathering more information will help assess their impact and ensure they meet the desired outcomes for infertile couples.<sup>[4]</sup> Several studies acknowledge the promising nature of Internet-based reproductive health education programs for infertile couples but also highlight the importance of conducting more research to assess their structure and effectiveness fully. Further investigations will help ensure that these programs can effectively address the needs of infertile couples and provide them with comprehensive and reliable support on their journey toward parenthood.<sup>[1-3]</sup>

Conducting a qualitative study is highly appropriate for meeting the needs of infertile couples. It allows researchers to explore the complex and subjective experiences, emotions, and perspectives associated with infertility, capturing rich insights into their challenges and coping mechanisms. This approach provides a comprehensive understanding of their unique journey toward parenthood. This study aims to investigate and understand the needs and potential benefits of implementing an online reproductive health education program for infertile couples through qualitative research methods.

## Materials and Methods

### Study design and setting

The present qualitative study, which used the conventional content analysis method, was conducted in Shahroud City, Iran from May 2022 to June 2022.

### Study participants and sampling

The study population consisted of all 12 infertile couples (24 individuals) and four key informants. The sample was intentionally diverse in terms of age, education level, employment, socioeconomic status, type, cause, and duration of infertility to account for how these factors impact couples' information needs and awareness. The inclusion criteria for participants were an Iranian couple with primary or secondary infertility, having used the Internet to seek information about infertility, and being able to communicate effectively. Also, the key informants were selected through a purposive sampling method, and their inclusion criteria were as follows: willingness to participate in the study, adequate experience in infertility treatment, and caring for infertile couples. Purposive sampling continued until data saturation was reached and no new information was obtained.

### Data collection tool and technique

Data were collected via face-to-face semi-structured interviews. The interviews were carried out in a private room at the infertility clinic. To better understand the couples' needs and perspectives, a couple of approaches were adopted for 12 couples. Because infertility involves both partners in a relationship, an interviewer can better understand the dynamics of the relationship, ensure information accuracy, improve transparency, and increase efficiency by meeting both partners.<sup>[5]</sup> Finally, 16 interviews, lasting from 30 to 45 minutes, were held. Purposive sampling continued until data saturation was reached and no new information was obtained. The question guide was prepared by reviewing the literature and consulting with experts. Table 1 lists some of the interview questions.

### Data analysis

The first author performed data analysis concurrently with data collection using the conventional content analysis approach recommended by Graneheim and Lundman.<sup>[6]</sup> The texts were read several times to identify general ideas. Meaning units were identified, related meaning units were combined, and codes were generated. Similar codes were merged, and those with related meanings were put in subcategories. The codes were sorted and divided into subcategories and categories. MAXQDA software version 12 was used to facilitate data analysis.

### Trustworthiness

Lincoln and Guba proposed four criteria for verifying qualitative data, namely credibility, transferability, confirmability, and dependability.<sup>[6]</sup> These criteria were considered in the current work to enhance the accuracy and validity of the study. To determine credibility, peer and faculty review, and participation were used to

**Table 1: A sample of interview questions**

---

In your opinion, what should be the key components of reproductive health education for infertile couples?
How important is it for couples experiencing infertility to have access to reproductive health education resources?
What are the most important factors you consider when searching for information about reproductive health online?
Can you explain your infertility experience and how you search the Internet for information and support?
What infertility and reproductive health topics must be adequately covered by available online resources?
What are the advantages and disadvantages of using an Internet-based reproductive health education program?
What multimedia resources are more helpful for you when learning about reproductive health online?
What suggestions are you for improving the accessibility and effectiveness of Internet-based reproductive health education programs for infertile couples?
Is there anything else you want to share about your experience with infertility or reproductive health education?

---

confirm and modify the codes and classifications so that the data obtained from the interviews were reviewed and revised by two authors after implementation and coding. Moreover, after analyzing the data, the two patients were contacted, and full text of the coded interviews was provided to them so that they could examine their conformity to their experiences. To determine the confirmability, two faculty experts on reproductive health were asked to study the interviews, codes, and extracted themes. To increase dependability, two reproductive health experts who were proficient in qualitative work were asked to recode the coding process to identify inconsistencies in coding. Besides, the researcher coded the interviews again two weeks after the initial holding (code-recode). To determine transferability, coding results were given to two participants who were qualified to participate in the research but were not part of the research community, and their opinions were recorded.

### Ethical considerations

The Ethics Committee of Shahrood University of Medical Sciences approved the study (IR.SHE.REC.1400.087). Participants gave written informed consent, and all data collected was kept confidential. The interviews were recorded with the permission of the participants. Also, at any stage of the research process, participants had the option of declining participation or withdrawing.

## Results

The findings emerged from the data analysis of the face-to-face and telephone interviews with 12 infertile couples (24 individuals) and 4 key informants who participated in this study. The demographic characteristics of the participants in this study are shown in Tables 2 and 3. The two themes included “Reproductive Health Education Needs” and “Preferences for Internet-based Reproductive Health Education and Support.” The themes, main categories, and subcategories are shown in Table 4.”

### Reproductive health education needs

According to the study’s findings, Reproductive Health Education Needs were categorized into two main categories: “Reproductive Health Literacy,” with six subcategories, and “Emotional and Psychological Support,” with five subcategories. Overall, the findings strongly advocate providing education and emotional and psychological support to couples facing infertility challenges, aiming to help them effectively navigate the situation.

### Reproductive health literacy

Interviews with infertile couples revealed that a significant number lacked adequate knowledge about

**Table 2: Demographic characteristics of the infertile couple’s participants (n=12)**

Variable	n (%)	Mean
Women’s Age (year)		31.36
Men’s Age		36.5
Men’s education Levels		
Primary school	3 (25/0)	
High School	4 (33/3)	
University	5 (41/7)	
Women’s education Levels		
Primary school	2 (16/7)	
High School	4 (33/3)	
University	6 (50/0)	
Economic Status		
Low	4 (33.3)	
Medium	5 (41.7)	
High	3 (25/0)	
Type of Infertility		
Primary	10 (83.3)	
Secondary	2 (16.7)	
Infertility Factors		
Male Factors	3 (25/0)	
Female Factors	5 (41.6)	
Combined Factors	2 (16.7)	
Unexplained Factors	2 (16.7)	
Infertility Duration (years)		4.44

**Table 3: Characteristics of the key informants**

Participants	Profession	Gender	Work experience in infertility clinic (years)
key informants 1	Midwife	Female	6
key informants 2	Midwife	Female	6
key informants 3	Nurse	Female	6
key informants 4	Infertility fellowship	Female	5

reproductive health. Consequently, they searched the Internet for information on various aspects, including reproduction and fertility physiology, causes and types of infertility, treatment options, lifestyle and nutrition impacts on fertility, and integrative medicine related to infertility.

Participants strongly believed that gaining knowledge about reproductive physiology would enable them to make informed decisions about their reproductive health, enhance overall well-being, and increase their chances of conception.

“Understanding reproductive physiology can help us better understand fertility, causes of infertility, and treatment options. Despite using the Internet to find answers, we can’t get reliable solutions due to our limited medical knowledge”(P. 6).

“No one has given us a full explanation for our infertility. When we know the cause of infertility, we can plan our treatment accordingly, which saves us

**Table 4: Themes, Main Categories, and Subcategories**

Themes	Main category	Subcategory
Reproductive Health Education Needs	Reproductive health literacy	Understanding the physiology of reproduction and fertility
		Understanding infertility and its causes
		Understanding the options for fertility treatments
		Understanding the effects of lifestyle and nutrition on fertility
		Understanding of integrative medicine and infertility
	Emotional and Psychological Support	Solutions for dealing with infertility
		Emotional support during decision-making for treatment
		Improving marital relationships
		Improving sexual performance
		General support for infertile couples (financial, legal, and jurisprudential advice)
Preferences for Internet-based Reproductive Health Education and Support	Technical and Logistical Considerations	User-Friendly Platform
		Interactive multimedia content: Accessibility (Compatibility with different devices and browsers)
		Social support networks
		Tailored Content
		Privacy and Confidentiality

time and money while making informed decisions about available treatments “(P. 4).

Regarding Understanding the options for fertility treatments, one health provider participating in the study stated:

“It is the patient’s right to know the process of assisted reproduction, the medications prescribed, and whether or not the treatment has benefits or side effects. A patient may stop treatment if side effects arise. In these fields, providing information can be helpful”(K.I 2).

Most participants emphasized the significance of lifestyle and nutrition choices in influencing fertility. One men participant expressed their experience, stating:

“While searching the Internet for advice on improving sperm strength or enhancing pregnancy prospects, I found a lack of sufficient information” (Male P. 7).

Several participants expressed a desire to delve into complementary and alternative medicine. Their interest led them to explore the Internet for information on infertility-related integrative medicine. One of the participants stated:

“There has been talk about how meditation, yoga, acupuncture, and herbal remedies could enhance fertility. We desire to know more about the effectiveness of these methods and identify reliable sources.” (P. 1).

**Emotional and psychological support**

A total of five subcategories were included in this category: Solutions for dealing with infertility, emotional support during decision-making for treatment, improving marital relations, improving sexual performance, and

general support for infertile couples (financial, legal, and jurisprudential advice).

Emotional and psychological support plays a crucial role in infertility, as the journey can be emotionally taxing, and having a supportive network can help individuals and couples cope with stress, maintain mental well-being, and foster a positive outlook during the challenging process of trying to conceive.

To cope with infertility’s emotional and physical challenges, participants searched the Internet for information and strategies. A key informant stated:

“Often, when working with couples, we encounter the importance of emotional support. Stress and anxiety associated with infertility can be managed by teaching couple’s techniques that help them overcome negative thoughts”(K.I.3)

A potential adverse effect of infertility is the disruption of sexual and marital relationships, loss of intimacy, misunderstandings, and conflicts for some participants. Participants emphasized the importance of adequate training and improved information to overcome these challenges.

“Fertility treatments can sometimes affect our sexual pleasure and emotional connection. During infertility and treatment, our family’s and our marriage’s emotional and marital relationships must stay intact. We need a good communication strategy with healthcare providers to solve these problems. This information is incomplete”(P. 12).

Participants raised concerns about the insufficiency and ambiguity of online information about the legal and jurisprudential aspects of infertility treatments, insurance coverage, and available financial support resources.

“A person’s ability to afford treatment can influence his or her decision to proceed with treatment.

We would appreciate it if a source could provide information or tell us what centers can provide better access to medicine and services in this area” (P. 11). Given the significance of the legal and jurisprudential aspects of infertility treatments, a woman facing infertility expressed:

“My husband doesn’t have sperm. It was offered to us to donate sperm. However, he’s strongly against it because of the ambiguity of jurisprudence (Islam’s view on this matter) and the legal aspects of it. Sadly, we found no good information or advice in these fields. The educational program will answer a lot of couples’ questions if these consultations are included” (Female P. 8).

### Preferences for Internet-based reproductive health education and support

The second theme of the study, “Preferences for Internet-based Reproductive Health Education and Support,” encompasses a category devoted to “Technical and Logistical Considerations” when designing educational programs for infertile couples.

### Technical and logistical considerations

In this category, which comprises six subcategories, most participants in this study emphasized the importance of designing a simple and comprehensible Internet-based educational program, emphasizing the need for easy and convenient access to information tailored to their specific needs.

“We have not seen any educational programs to help infertile couples, but we are looking for one that can help us. It is essential for us that the program has a simple and understandable language. Besides, we should have easy and convenient access to information to meet our needs”(P. 3).

Participants found interactive multimedia content, such as videos, animations, quizzes, and other interactive elements, beneficial in the educational program. The participants stated that using these elements can enhance the learning process.

“Showing the process of methods such as IVF or IUI through instructional videos that are available to us would be very helpful. We remember these educational points better when we watch these videos”(P. 5).

Couples suggested that the educational program should be accessible on multiple devices like laptops, tablets, and smartphones. They emphasized the importance of compatibility with different devices and browsers to enhance efficiency.

“Computers, laptops, and mobile phones are all devices we use to access the Internet. Depending on

the device and our preferences, we also use different browsers. However, sometimes we need help with websites working correctly on our devices, and searching is difficult”(P. 7).

According to some participants linking infertile couples with social support networks enables communication with others facing similar challenges. “Being part of online groups like Telegram and WhatsApp, connects us with infertile women nationwide, alleviating feelings of isolation, enabling stress management, and facilitating information exchange. We are interested in a discussion forum with educational content supervised by experts” (8 Females. Participants).

According to one of the health providers, many couples are eager to personalize Internet-based educational resources to cater to their circumstances and specific needs.

“Tailored education is crucial for couples. For instance, if male factors cause infertility, addressing issues like improving sperm quality and quantity becomes essential. Recognizing that every couple has unique needs, providing individualized attention and support is paramount ” (K.I.1).

Most couples expressed significant concern about the privacy and confidentiality of their infertility information.

“When it comes to infertility, it is a highly personal and sensitive matter. We are determined not to have our personal information shared or accessed by anyone who should not have access to it. Therefore, safeguarding our privacy is paramount when selecting an online education provider”(P. 9).

## Discussion

This study aims to investigate and understand the needs and potential benefits of implementing an online reproductive health education program for infertile couples through qualitative research methods. The aim is to identify the specific educational needs and challenges faced by infertile couples and explore the feasibility and effectiveness of an online program in addressing these needs and improving reproductive health outcomes.

Internet use for reproductive health and infertility information has increased, and participants stated a strong desire for software to make accessible information available. Similar research by Stenström (2020) and Conceição, *C et al.* (2017) found that electronic learning interventions improved reproductive health knowledge. Based on the results of these research electronic learning may be a viable method of enhancing health literacy and empowering individuals to make informed decisions about reproductive health since it provides precise and reliable filtered information.<sup>[7,8]</sup>

In the present study, while many couples reported the benefits of online experiences, some raised concerns about the accuracy of available information online. A study by Bujnowska-Fedak and Węgierek Bujnowska-Fedak, M. M., and Węgierek, P. (2020) (2020) depicts the potential of Internet-based health information to have positive and negative effects. This research emphasized the potential positive and negative consequences of Internet-based health information. While the Internet enables people to engage in healthcare actively, the study raises concerns about its effectiveness due to the need for more quality information on many health conditions.<sup>[9]</sup>

Our study confirmed that understanding reproductive physiology is beneficial in addressing infertility challenges, aligning with the findings of Harper JC *et al.* (2021) and Mertes H *et al.* (2023). These researchers emphasize the importance of education and awareness regarding infertility. By enhancing public awareness about factors that can influence fertility and are modifiable, the risk of infertility and the need for infertility treatments could be reduced. Additionally, better informing women and men of reproductive age about how age and certain modifiable factors impact fertility and the significance of optimal preconception health could lead to improved pregnancy outcomes and better overall health for babies from birth through adulthood.<sup>[10,11]</sup>

Khadivzadeh *et al.* (2021),<sup>[12]</sup> write that infertility and fertility knowledge can be significantly improved through education, and health promotion strategies show greater effectiveness when integrated with educational interventions.

Based on the findings of the present study, participants expressed a need to obtain information regarding integrative medicine in treating infertility through the Internet. Sharifi, F., and Roudsari, R. L. (2022). (2022) explored complementary and alternative medicine (CAM) among infertile women. The findings emphasized the significance of healthcare providers being aware of CAM and fostering open, respectful communication with patients about its usage of healthcare providers being aware of CAM and fostering open, respectful communication with patients about its usage.<sup>[13]</sup> This is in line with the present study.

In our study, we discovered that infertility stress had a detrimental impact on various aspects of participants' lives, prompting them to explore stress management strategies through online educational programs. Negris O *et al.* (2021) identified a lack of emotional support as a notable weakness in infertility treatment. They emphasized the importance of partner and community involvement in caring for couples, as it served as a vital

source of positive energy, leading to improved treatment outcomes by reducing psychological stress.<sup>[14]</sup> Therefore, it is possible to achieve this goal by including strategies to reduce infertility for infertile couples in Internet-based educational programs.

The study participants highlighted their desire for information concerning the legal and ethical aspects of alternative methods, aligning with the findings of Mahtab S Mahtab, S *et al.* (2019) and Kooli C Kooli, C. (2020) (2020), who emphasized the need for counseling based on providing legal information to protect the rights and interests of all involved parties. This approach advocates for a comprehensive and proactive strategy in addressing infertility issues, allowing clinics and treatment centers to ensure alternative therapies.<sup>[15,16]</sup>

Technological considerations in Internet-based reproductive health education are crucial to designing effective and user-friendly programs. The results of this study found that participants emphasized the significance of technological factors contributing to a positive learning experience. It is vital to consider the integration of user-friendly interfaces, interactive multimedia content, device compatibility, and social support networks and maintaining the security and confidentiality of information on websites when creating Internet-based reproductive health education programs.

Aligning with previous research, considerations for improving the educational program should prioritize a user-friendly interface, as it enhances interaction and user experience.<sup>[17]</sup>

In our study, participants highlighted the importance of integrating interactive multimedia content, including text, audio, video, images, and animations, to create an engaging Internet-based learning environment.

In this line, the study of Peláez, C. A., and Solano, A. (2023)<sup>[18]</sup> suggests that incorporating gamification and interactive multimedia can enhance learning experiences, particularly in early education settings.

Our study's results revealed that customizing the content of an educational program to cater to individual preferences was impactful. In support of these findings, Nguyen *et al.*<sup>[19]</sup> emphasize that tailoring educational program content to individual preferences can lead to more effective learning outcomes.

In line with our study's findings, Bader, W. I., and Hammouri, A. I. (2016).<sup>[20]</sup> demonstrated the significance of training with different devices and browsers to ensure easy access and a unified user experience.

The results of our study emphasized the importance of creating social support networks, as this platform can facilitate participants' interaction, experience sharing, and support seeking. The results of Prescott J *et al.*'s<sup>[21]</sup> study also confirm the results of our study.

Lastly, participants emphasized the utmost importance of safeguarding users' information through strong privacy and security measures to instill trust and confidence in the educational program. Grunberg *et al.* (2018) conducted a study that incorporated the findings of other researchers examining patient privacy concerns online. The authors concluded that websites offering Internet-based education should implement appropriate measures to protect the privacy and security of their users' information.<sup>[22]</sup>

### Limitations and recommendation

As with any other studies, the current research has limitations. The study's participants might lack diversity in cultural backgrounds, affecting understanding cultural influences on reproductive health education needs and preferences. In addition, the infertile couples might have been unwilling to express reality and their true feelings. The strengths of this study lie in its robust and beneficial approach of utilizing qualitative methods and conducting a thorough examination of participants' experiences. These strengths enable the research to effectively address the specific needs of infertile couples within Internet-based reproductive health education and support.

### Conclusion

This study offers valuable insights for designing and implementing an effective Internet-based reproductive health education program tailored to the needs of infertile couples. Considering their unique preferences and requirements, such a program can significantly improve reproductive health outcomes and overall well-being. Furthermore, the application of these study findings can enhance the quality and accessibility of reproductive health education and support for infertile couples. By harnessing the power of technology and taking into account the specific needs of this population, Internet-based programs can play a crucial role in providing essential support to couples as they navigate their journey toward parenthood.

### Acknowledgments

The present study was part of the results of the Ph.D. thesis approved by Shahroud University of Medical Sciences (Thesis code: 1025). We sincerely want to thank our colleagues who provided advice that helped us significantly in writing the paper. In addition, we would like to thank all the participants in this study.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

- Hesari ZHNA, Lotfi R, Pouragha B, Badehnoosh B, Yazdkhasti M. The need for a training software among Iranian infertile couples: A qualitative study. *Int J Fertil Steril* 2019;13:118-26.
- Brochu F, Robins S, Miner SA, Grunberg PH, Chan P, Lo K, *et al.* Searching the internet for infertility information: A survey of patient needs and preferences. *J Med Internet Res* 2019;21:e15132.
- Hamidzadeh A, Salehin S, Naseri Boori Abadi T, Chaman R, Mogharabian N, Keramat A. The effect of e-health interventions on meeting the needs of individuals with infertility: A narrative review. *Middle East Fertil Soc J* 2023;28:12.
- Brayboy LM, McCoy K, Thamotharan S, Zhu E, Gil G, Houck C. The use of technology in the sexual health education especially among minority adolescent girls in the United States. *Curr Opin Obstet Gynecol* 2018;30:305-9.
- Read SC, Carrier M-E, Boucher M-E, Whitley R, Bond S, Zelkowitz P. Psychosocial services for couples in infertility treatment: What do couples really want? *Patient Educ Couns* 2014;94:390-5.
- Graneheim UH, Lundman B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today* 2004;24:105-12.
- Stenström K. Involuntary childlessness online: Digital lifelines through blogs and Instagram. *New Media Soc* 2022;24:797-814.
- Conceição C, Pedro J, Martins MV. Effectiveness of a video intervention on fertility knowledge among university students: A randomised pre-test/post-test study. *Eur J Contracept Reprod Health Care* 2017;22:107-13.
- Bujnowska-Fedak MM, Węgierek P. The impact of online health information on patient health behaviours and making decisions concerning health. *Int J Environ Res Public Health* 2020;17:880.
- Harper JC, Hammarberg K, Simopoulou M, Koert E, Pedro J, Massin N, *et al.* The international fertility education initiative: Research and action to improve fertility awareness. *Hum Reprod Open* 2021:hoab031.
- Mertes H, Harper J, Boivin J, Ekstrand Ragnar M, Grace B, Moura-Ramos M, *et al.* On Behalf of The International Reproductive Health Education Collaboration Irhec. Stimulating fertility awareness: The importance of getting the language right. *Hum Reprod Open* 2023;2023:hoad009.
- Khadivzadeh T, Rahmati R, Esmaily H. Effect of education on knowledge of fertility counseling and attitudes toward fertility control. *J Educ Health Promot* 2021;10:319.
- Sharifi F, Roudsari RL. Complementary and alternative medicine use in infertility: A review of infertile women's needs. *J Educ Health Promot* 2022;11:195.
- Negris O, Lawson A, Brown D, Warren C, Galic I, Bozen A, *et al.* Emotional stress and reproduction: What do fertility patients believe? *J Assist Reprod Genet* 2021;38:877-87.
- Mahtab S, Alsadat EP, Ahmad R, Abbasi J. New approach to ethics in fertility. *Rev Latinoam Hipertens* 2019;14:656-63.
- Kooli C. Review of assisted reproduction techniques, laws, and regulations in Muslim countries. *Middle East Fertil Soc J* 2020;24:1-15.
- Education OI. Educating for Innovation: The Power of Digital Technologies and Skills. *Education Innovation and Research*. 2016.

18. Peláez CA, Solano A. A practice for the design of interactive multimedia experiences based on gamification: A case study in elementary education. *Sustainability* 2023;15:2385.
19. Nguyen MH, Smets EM, Bol N, Loos EF, van Laarhoven HW, Geijsen D, *et al.* Tailored web-based information for younger and older patients with cancer: Randomized controlled trial of a preparatory educational intervention on patient outcomes. *J Med Internet Res* 2019;21:e14407.
20. Bader WI, Hammouri AI. Responsive web design techniques. *Int J Comp App* 2016;150:18-27.
21. Prescott J, Rathbone AL, Brown G. Online peer to peer support: Qualitative analysis of UK and US open mental health Facebook groups. *Digit Health* 2020;6:2055207620979209.
22. Grunberg PH, Dennis C-L, Da Costa D, Zerkowitz P. Infertility patients' need and preferences for online peer support. *Reprod Biomed Soc Online* 2018;6:80-9.