

# What are the Thoughts of Women Whose Husbands' Frozen Testicular Sperm Is Thawed for in vitro Fertilization on the Day of Oocyte Retrieval? A Qualitative Study

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**Objective:** The psychological experiences will be analyzed to understand the needs and burdens of women on the day of oocyte retrieval when the thawed testicular sperm of their husbands is used for in vitro fertilization, in order to provide a basis for the subsequent formulation of relevant nursing measures.

**Methods:** This study utilized a descriptive phenomenological research approach. A cohort of 13 women undergoing oocyte retrieval on the day when thawed testicular sperm from their husbands is used for in vitro fertilization at the Reproductive Medicine Center of Sir Run Run Shaw Hospital, Zhejiang University School of Medicine, between August and October 2024, were chosen as participants for this study. Semi-structured, in-depth interviews were conducted to gather qualitative data. The Colaizzi 7-step analysis method was subsequently utilized to analyze the interview transcripts and identify emerging themes.

**Results:** The analysis yielded 3 themes: (1) facing challenges and requiring assistance (a. demonstrate a strong desire to acquire professional knowledge; b. demonstrate a strong desire for recognition); (2) overwhelming psychological stress (a. concerns about potential privacy breaches; b. concerns about security issues; c. concerns about the therapeutic efficacy); (3) improving family atmosphere and marital relationships (a. communication between couples has increased.; b. shared expectations for children help couples establish a common goal).

**Conclusion:** It is recommended that healthcare practitioners implement strategies to enhance patient education and awareness surrounding assisted reproductive technology. Additionally, establishing and strengthening social support, reinforcing privacy protections and safety measures, promoting effective communication between partners, and managing treatment outcome expectations are crucial steps forward.

**Immediate Practical Implications:** Women prioritize treatment efficacy, privacy preservation, and the necessity of acquiring comprehensive professional knowledge when employing their partner's testicular sperm for in vitro fertilization. The study is instrumental in shaping policy dialogues on reproductive health, highlighting the critical significance of women's psychological health in the realm of in vitro fertilization.

**Keywords:** azoospermia, assisted reproductive technology, women, qualitative research

## Introduction

An estimated 15% of couples worldwide encounter infertility issues, with male infertility accounting for 50% of cases.<sup>1</sup> Azoospermia, characterized by the absence of sperm in a man's semen, is a key contributor to male infertility. Azoospermia can be classified into two main types based on its etiology: obstructive azoospermia (OA) and non-obstructive azoospermia (NOA).<sup>2</sup> Obstructive azoospermia results from blockages in the seminal ducts or epididymis, impeding the release of sperm into the semen, while non-obstructive azoospermia arises from testicular dysfunction or disruptions in the sperm production process. For individuals with azoospermia, testicular sperm retrieval can be

performed through testicular puncture or microsurgical sperm extraction, with the harvested sperm subsequently cryopreserved for future use. On the day of oocyte retrieval, thawed testicular sperm is employed for in vitro fertilization, followed by embryo cultivation.<sup>3</sup> This method has emerged as a significant assisted reproductive technology approach for individuals with azoospermia. However, compared to the sperm of normal males, sperm from the testes often exhibit lower motility and maturity levels, making them more susceptible to damage during cryopreservation. Following thawing, both the quantity and viability of the sperm may decrease, potentially leading to psychological distress among couples grappling with infertility.<sup>4</sup>

Women play an indispensable role as partners for individuals with azoospermia. This is because, for a patient with azoospermia who aspires to procreate a child with a biological connection, the collaboration of their spouse in undergoing assisted reproductive technology (ART) procedures is essential.<sup>5</sup> Oocyte retrieval represents a critical stage in assisted reproductive technology, aiming to extract mature oocytes from the ovaries of female patients for subsequent fertilization in a laboratory setting.<sup>6</sup> Typically, prior to oocyte retrieval, women undergo ovulation induction therapy. Following the attainment of appropriate follicular size, an injection of HCG (Human Chorionic Gonadotropin) or similar agents is administered to induce oocyte maturation within the follicles. Oocyte retrieval is generally scheduled around 36 hours post-injection. This procedure, performed under mild anesthesia or analgesia, involves the utilization of a needle guided by ultrasound to penetrate the vaginal wall and access the ovary for aspirating the fluid containing oocytes. The duration of the procedure typically ranges from 20 to 30 minutes. The aspirated fluid is promptly assessed in the laboratory to identify and isolate mature oocytes, which can then be utilized for fertilization or cryopreservation. Many women undergoing this process may experience significant emotional and psychological strain, stemming from various factors such as apprehensions regarding the surgical procedure, uncertainties and expectations regarding the outcomes, and physical discomfort.<sup>7</sup> Some studies suggest that women experience notably higher levels of psychological distress compared to men in similar situations.<sup>8</sup>

The presence of negative emotions may impede the fertility of women by complicating the conception process.<sup>9</sup> Recent studies have focused on the mental well-being of spouses of men with azoospermia.<sup>10,11</sup> Research indicates that the psychological experiences of these women during assisted reproductive treatments are multifaceted and intricate, encompassing emotions, mental health, marital dynamics, and social interactions. Throughout the assisted reproductive treatment process, these women undergo significant emotional fluctuations, including feelings of hope, disappointment, anxiety, sadness, and occasional joy. These emotional changes are closely tied to the treatment process and its outcomes. Therefore, exploring the psychological experiences of women at specific treatment milestones may yield valuable and representative insights. On the day of oocyte retrieval, women encounter the surgical procedure and grapple with uncertainties surrounding the use of their partners' sperm. Despite these challenges, there is a current gap in research regarding their psychological experiences.

## Aim

This research is to investigate the psychological experiences of women on the day of oocyte retrieval when the thawed testicular sperm of their husbands is used for in vitro fertilization. The characteristics of the psychological experiences will be analyzed to understand the needs and burdens of women, in order to provide a basis for the subsequent formulation of relevant nursing measures.

## Method

### Design

This research employed a descriptive phenomenological research approach within the realm of qualitative research. The descriptive phenomenological research approach aims to depict participants' experiences without imposing interpretations, with the goal of capturing the essence of the real world. For this research, women who have undergone oocyte retrieval using their husbands' thawed testicular sperm would be selected as interview subjects to explore their inner experiences.

## Participants

The participant count is ascertained contingent upon the outcomes of the interviews. Enrollment ceases upon reaching a point where no additional interview data emerges. Finally, we recruited 13 women who had undergone oocyte retrieval surgery at our hospital's reproductive medicine center between August and October 2024. We conducted interviews with these women on the day of the oocyte retrieval procedure, during which the thawed testicular sperm from their husbands was utilized for in vitro fertilization.

### Inclusion/Exclusion Criteria

Participants were selected based on the following criteria: a. married women aged over 20 years old; b. the husbands of the participants had previously cryopreserved their testicular sperm at the reproductive medicine center and requested its thawing on the day of oocyte retrieval for in vitro fertilization; c. willingness to participate in the study and signing of the informed consent form.

Exclusion criteria for this study comprised: a. female infertility stemming from tubal factors or uterine factors; b. a history of mental disorders, recent significant psychological trauma, or other stressful events.

The study is terminated under the following circumstances: the participant voluntarily withdraws from the study, or the researcher determines that the participant's physical condition is not suitable for further participation in the study.

This study adheres to the Declaration of Helsinki. The ethical considerations of the study underwent a comprehensive review and received approval from the Ethics Committee of Sir Run Run Shaw Hospital, School of Medicine, Zhejiang University (approval number: 2024-0589). Prior to the inclusion of each research subject in the study, the responsible researcher was required to provide them with a written, detailed account of the study's purpose, nature, procedures, potential benefits, and risks. Research subjects were informed of their right to withdraw from the study at any time. They were given adequate time to consider participation before being included. Only after voluntary participation and signing of the informed consent form were research subjects included in the study. The vulnerable group potentially involved in this study is the illiterate population. Illiterates had been approved as participants by the ethics committee. In cases where research subjects were unable to read the informed consent form, a witness was required to observe the informed consent process and sign the form. Ultimately, a total of 13 patients voluntarily participated in the study, which included the publication of anonymized data, demonstrating their willingness to participate in the study. A summary of their information is presented in [Table 1](#).

## Qualitative Interview Design

Semi-structured interviews were utilized in this study. The interview questions have been meticulously crafted following an exhaustive review of existing literature and collaborative discussions among all contributing authors, with the aim of ensuring both the comprehensiveness and pertinence of the inquiries posed. Subsequently, researchers He Yu and Zhang Chen conducted a pilot test with two participants to evaluate the clarity of the interview questions and to identify and refine any sections that were not readily comprehensible by the participants. The final interview questions are as follows: a. What is your level of familiarity with testicular sperm? Have you encountered this concept previously? b. How did you react upon learning that your husband's testicular sperm could be utilized for conception? c. How did you feel throughout the preservation period while your husband's testicular sperm was being frozen and thawed today? d. What are your thoughts now that your husband's testicular sperm has been thawed for in vitro fertilization? e. Has the use of testicular sperm for assisted reproduction affected your marital relationship? f. What recommendations do you have regarding the utilization of testicular sperm in assisted reproductive procedures?

## Procedure

A warm and tranquil independent consultation room was selected for conducting face-to-face semi-structured interviews with patients who meet the inclusion criteria. Two researchers (Chen Xiaojie and Zhang Chen) with professional training and interviewing experience simultaneously conducted the interviews. The interviews were scheduled following the patient's oocyte retrieval procedure. The researchers explained the research purpose, methods, confidentiality principles, and the need for audio recording to the patients. Once consent was obtained, the interview proceeded based on the

**Table 1** Characteristics of the Study Participants (N = 13)

Num.	Age	Marriage/Years	Occupation	Education	Per Capita Monthly Household Income(RMB)	Years of Diagnosis of Spousal Azoospermia	Number of Oocyte Retrieval Procedures
1	32	F/7Y	Teacher	Bachelor	5001~10000	5Y	3
2	27	F/2Y	White-collar worker	Bachelor	5001~10000	1Y	1
3	30	F/6Y	Saleswoman	Bachelor	>10000	4Y	1
4	33	F/11Y	Saleswoman	High school	5001~10000	3Y	4
5	35	S/10Y	Waitress	High school	3000~5000	2Y	1
6	28	F/2Y	White-collar worker	Bachelor	>10000	1Y	2
7	25	F/1Y	Housewife	High school	5001~10,000	<1Y	1
8	29	F/4Y	Lawyer	master	>10000	1Y	2
9	36	F/7Y	Teacher	Bachelor	5001~10000	5Y	4
10	41	F/15Y	Saleswoman	High school	>10000	4Y	3
11	34	F/10Y	Government staff	Master	5000~10000	3Y	3
12	31	F/3Y	Accountant	Bachelor	5000~10000	1Y	2
13	23	F/2Y	Worker	High school	3000~5000	1Y	1

**Abbreviations:** F, First Marriage; S, Second Marriage; Y, Years/Year.

provided outline. Interviewing techniques were utilized such as encouragement, active listening, and allowing for moments of silence. Detailed notes were taken during the interview, capturing the patient's expressions, tone of voice, gestures, and other notable cues. The interview duration maintained between 30 to 45 minutes. Following the interview, the patient's data was verified with them to ensure accuracy. Within 24 hours, the audio recordings were transcribed into text format and stored by NVivo software.

## Data Analysis

Data collection and analysis was conducted concurrently in this study. Following the completion of each interview, the recording was promptly transcribed into textual data, and the accuracy of the transcribed text was verified by two individuals. The Colaizzi method was utilized for data analysis, involving the following steps:

1. Thoroughly review all data: Read through each text multiple times to fully understand and familiarize oneself with the information provided by the research participants, in conjunction with on-site notes.
2. Identify significant statements: Analyze the text word by word, highlighting key words and sentences that are recurrent and relevant to the research question.
3. Code the recurring perspectives: Construct/code the meanings of the recurring perspectives identified.
4. Consolidate the coded perspectives: Review, reflect on, and group all the meaning units into initial themes.
5. Provide detailed and comprehensive descriptions: Define and describe each initial theme generated in the previous step.
6. Identify common perspectives: Offer detailed explanations for the themes identified in the previous step.
7. Validate with participants: Confirm the fundamental structure to ensure the accuracy and reliability of the analysis.

## Results

### Participants

The study cohort comprises 13 individuals, aged 23 to 41 years, whose partners were diagnosed with azoospermia within the past 1 to 5 years. At the time of interview, five participants had experienced a single oocyte retrieval procedure, whereas two had undergone this procedure on four occasions. For further details, refer to [Table 1](#).

## Thematic Analysis

The analysis yielded 3 themes: (1) facing challenges and requiring assistance (a. demonstrate a strong desire to acquire professional knowledge; b. demonstrate a strong desire for recognition); (2) overwhelming psychological stress (a. concerns about potential privacy breaches; b. concerns about security issues; c. concerns about the therapeutic efficacy); (3) improving family atmosphere and marital relationships (a. communication between couples has increased.; b. shared expectations for children help couples establish a common goal). See [Table 2](#).

### Facing Challenges And Requiring Assistance

#### Demonstrate a Strong Desire to Acquire Professional Knowledge

As the wives of men with azoospermia, women have confusion about the approaches and mechanisms of assisted reproductive treatment and are full of curiosity about the ways of obtaining testicular sperm and how it is effectively utilized.

Participant 3 (P3) recalled, “Initially, we were unaware that individuals in our situation had the opportunity to conceive children. We believed we would simply be companions for each other throughout our lives. However, upon learning that a couple facing male infertility could still have a child, we approached the situation with a ‘let’s give it a try’ mindset”. Participant 2 (P2) shared, “Prior to my oocyte retrieval procedure, my husband was slated to undergo surgery for testicular sperm extraction, with the retrieved sperm then being cryopreserved. The physician informed us that the thawing process would precede the use of the sperm, and we were uncertain about the potential impact of freezing and thawing on the sperm, given their immense value to us”. Participant 10 (P10) voiced her uncertainty, stating, “Apart from the variances in acquisition methods, we lack understanding regarding the distinctions between testicular sperm and ejaculated sperm, and whether these variances could impact embryo development”.

#### Demonstrate a Strong Desire for Recognition

Due to the lack of effective online health information and the underrepresentation of successful cases, infertile couples believe that hospitals and society should pay more attention to this population. Additionally, women undergoing oocyte retrieval procedures experience physical pain, which can lead to emotional vulnerability and feelings of loneliness, and hope that their husbands will be more considerate.

Participant 13 (P13) remarked, “There are numerous couples facing similar challenges as us, yet it appears that there is a scarcity of credible information on male azoospermia-related childbirth experiences online, with some sources being ineffective advertisements. Some couples who have successfully conceived with azoospermia may opt not to disclose their treatment facilities. Fortunately, we came across an individual who anonymously shared his treatment journey online, and we were able to connect with him privately”. Participant 7 (P7), visibly emotional, expressed, “I love my husband dearly, and thus, I had no hesitation in embarking on this treatment journey together. I was in good health previously, but following today’s surgery, I am experiencing significant pain. My husband is incredibly supportive, always attentive to my needs and fulfilling my wishes. However, upon waking up from the anesthesia, the pain was still intense, leading me to shed a few tears (accompanied by a nervous chuckle)”.

### Overwhelming Psychological Stress

#### Concerns About Potential Privacy Breaches

Influenced by traditional culture and for the sake of dignity, women do not wish for their experiences of assisted reproductive treatment to be known to others, particularly relatives or friends.

Participant 1 (P1) disclosed, “We opted to keep our visits to the hospital confidential, not even informing my husband’s parents. We harbored fears that if our situation became known, we would face judgment and ridicule. Each time I visit the hospital, I am vigilant, scanning my surroundings to avoid encountering acquaintances”. Participant 4 (P4) sadly chuckled, “I dare not reveal to my friends the reason my husband and I are seeking medical assistance for his azoospermia. I married at 22, a decision met with skepticism from others who believed I was too young to settle down. Now, with the discovery of my husband’s condition, the thought of disclosing this adds to my apprehension. I simply

**Table 2** Results of the Interview (N = 13)

Themes		Topics
I. Facing challenges and requiring assistance.	(1) Demonstrate a strong desire to acquire professional knowledge.	<p>"Initially, we were unaware that individuals in our situation had the opportunity to conceive children. We believed we would simply be companions for each other throughout our lives. However, upon learning that a couple facing male infertility could still have a child, we approached the situation with a 'let's give it a try' mindset". P3</p> <p>"Prior to my oocyte retrieval procedure, my husband was slated to undergo surgery for testicular sperm extraction, with the retrieved sperm then being cryopreserved. The physician informed us that the thawing process would precede the use of the sperm, and we were uncertain about the potential impact of freezing and thawing on the sperm, given their immense value to us".P2</p> <p>"Apart from the variances in acquisition methods, we lack understanding regarding the distinctions between testicular sperm and ejaculated sperm, and whether these variances could impact embryo development".P10</p>
	(2) Demonstrate a strong desire for recognition.	<p>"There are numerous couples facing similar challenges as us, yet it appears that there is a scarcity of credible information on male azoospermia-related childbirth experiences online, with some sources being ineffective advertisements. Some couples who have successfully conceived with azoospermia may opt not to disclose their treatment facilities. Fortunately, we came across an individual who anonymously shared his treatment journey online, and we were able to connect with him privately". P13</p> <p>"I love my husband dearly, and thus, I had no hesitation in embarking on this treatment journey together. I was in good health previously, but following today's surgery, I am experiencing significant pain. My husband is incredibly supportive, always attentive to my needs and fulfilling my wishes. However, upon waking up from the anesthesia, the pain was still intense, leading me to shed a few tears (accompanied by a nervous chuckle)".P7</p>

2.Overwhelming psychological stress	(1) Concerns about potential privacy breaches	<p>"We opted to keep our visits to the hospital confidential, not even informing my husband's parents. We harbored fears that if our situation became known, we would face judgment and ridicule. Each time I visit the hospital, I am vigilant, scanning my surroundings to avoid encountering acquaintances". P1</p> <p>"I dare not reveal to my friends the reason my husband and I are seeking medical assistance for his azoospermia. I married at 22, a decision met with skepticism from others who believed I was too young to settle down. Now, with the discovery of my husband's condition, the thought of disclosing this adds to my apprehension. I simply feign contentment to maintain appearances". P4</p> <p>"It is imperative that we maintain confidentiality, right? We must safeguard our privacy. This is not a matter to boast about".P6</p>
3.Improving Family Atmosphere and Marital Relationships	(2) Concerns about security issues	<p>"Having witnessed instances in the past where hospitals misidentified patients, I am concerned today as my husband's sperm is being thawed. I fear the possibility of it being mistakenly utilized as another individual's sperm". P5</p> <p>"Given our lack of insight into the hospital's procedures for matching sperm and eggs during fertilization, we harbor concerns about potential errors arising from distractions or fatigue among the medical staff. While I assume the hospital has established protocols and safeguards to prevent such mishaps, the thought of such an error occurring is distressing for both my husband and me".P8</p>
	(3) Concerns about the therapeutic efficacy	<p>"The physician informed us about the potential impact of sperm thawing. Given our three-year struggle to conceive and multiple unsuccessful attempts across various medical facilities, my husband and I are deeply apprehensive. We are now fervently hoping for a positive outcome this time". P10</p> <p>"Lacking advanced education and substantial income, we have traversed numerous hospitals, undergone various treatments, and invested significant financial resources in our quest for parenthood. This ongoing challenge has taken a toll on our mental well-being and affected our professional lives. If this endeavor proves unsuccessful once more, we will experience profound disappointment, akin to drawing water with a bamboo basket—fruitless".P4</p>
	(1) Communication between couples has increased.	<p>"I harbor deep affection for my husband. Despite his diagnosis of the illness a year ago, he broached the topic of divorce. I reassured him that the prospect of having children was inconsequential; what truly counted was our love for each other. Since then, our bond has grown stronger. We engage in open communication, and nothing can sever our connection". P6</p> <p>"We actively exchange pertinent news and treatment insights sourced from the internet, offering each other mutual support. It appears that our relationship has evolved positively compared to the past". P9</p>
	(2) Shared expectations for children help couples establish a common goal.	<p>"In the past, my husband and I pursued separate interests without intruding on each other's space or comprehending each other's realms. Presently, we are aligned towards a shared objective, akin to establishing a business partnership (covers her mouth and smiles)".P11</p> <p>"We both harbor a profound affection for children. Observing youngsters on the street fills us with delight, fueling our eagerness to have our own. Occasionally, I indulge in watching online videos centered around children".P12</p>

**Abbreviation:** P, Participant.



feign contentment to maintain appearances”. Participant 6 (P6) expressed concern, stating, “It is imperative that we maintain confidentiality, right? We must safeguard our privacy. This is not a matter to boast about”.

### Concerns About Security Issues

Children hold significant importance for a family. As assisted reproductive technology encompasses the combination of eggs and sperm to assist patients in having their own children, it is intimately associated with the future happiness of the family. Some women are apprehensive that improper operations and procedures in hospitals might lead to an inaccurate combination of eggs and sperm, thereby “producing” incorrect children.

Participant 5 (P5) expressed hesitance, “Having witnessed instances in the past where hospitals misidentified patients, I am concerned today as my husband’s sperm is being thawed. I fear the possibility of it being mistakenly utilized as another individual’s sperm”. Participant 8 (P8) shared, “Given our lack of insight into the hospital’s procedures for matching sperm and eggs during fertilization, we harbor concerns about potential errors arising from distractions or fatigue among the medical staff. While I assume the hospital has established protocols and safeguards to prevent such mishaps, the thought of such an error occurring is distressing for both my husband and me”.

### Concerns About the Therapeutic Efficacy

There are some women who are worried that their husbands’ sperm might be impaired during the process of storage or thawing to the extent that it becomes unusable. There are still some individuals who are deeply apprehensive. They not only worry about the poor quality of eggs or sperm but also are filled with anxiety regarding the quality of embryos and the outcome of embryo transplantation.

Participant 10 (P10) remarked, “The physician informed us about the potential impact of sperm thawing. Given our three-year struggle to conceive and multiple unsuccessful attempts across various medical facilities, my husband and I are deeply apprehensive. We are now fervently hoping for a positive outcome this time”. Participant 4 (P4) disclosed, “Lacking advanced education and substantial income, we have traversed numerous hospitals, undergone various treatments, and invested significant financial resources in our quest for parenthood. This ongoing challenge has taken a toll on our mental well-being and affected our professional lives. If this endeavor proves unsuccessful once more, we will experience profound disappointment, akin to drawing water with a bamboo basket—fruitless”.

### Improving Family Atmosphere and Marital Relationships

#### Communication Between Couples Has Increased

When the husband is helpless, as a wife, a woman is likely to be highly willing to be by the husband’s side, express her thoughts to him, and encourage him to undergo treatment.

Participant 6 (P6) blushed as she shared, “I harbor deep affection for my husband. Despite his diagnosis of the illness a year ago, he broached the topic of divorce. I reassured him that the prospect of having children was inconsequential; what truly counted was our love for each other. Since then, our bond has grown stronger. We engage in open communication, and nothing can sever our connection”. Participant 9 (P9) conveyed, “We actively exchange pertinent news and treatment insights sourced from the internet, offering each other mutual support. It appears that our relationship has evolved positively compared to the past”.

### Shared Expectations for Children Help Couples Establish a Common Goal

The anticipation of having a child endows women and their husbands with a common objective. The entire family is like a ship, having a definite forward direction.

Participant 11 (P11) expressed, “In the past, my husband and I pursued separate interests without intruding on each other’s space or comprehending each other’s realms. Presently, we are aligned towards a shared objective, akin to establishing a business partnership (covers her mouth and smiles)”. Participant 12 (P12) revealed, “We both harbor a profound affection for children. Observing youngsters on the street fills us with delight, fueling our eagerness to have our own. Occasionally, I indulge in watching online videos centered around children”.



## Discussion

### Enhance Education and Consciousness of Assisted Reproductive Technology (ART)

The results in this research indicated that patients with azoospermia and their spouses had difficulty in obtaining treatment information. The reasons may be divided into two aspects: one is that the treatment method and treatment results of azoospermia are not well publicized by medical institutions; the other is that patients and their spouses are not willing to take the initiative to share effective information due to their own psychological factors such as low self-esteem.<sup>12</sup> To fulfill the information requirements of patients regarding ART, healthcare institutions should adopt proactive strategies to escalate patient education and awareness.<sup>13</sup> Medical professionals in conjunction with expert designers have collaboratively developed a standardized informational manual encompassing the fundamentals of ART, encompassing treatment protocols, efficacy rates, and potential adverse effects. This manual is structured in a question-and-answer format to enhance the efficiency of information retrieval. Furthermore, a dedicated website has been established to offer video tutorials, online seminars, and real-time question-and-answer sessions, ensuring that the content is perpetually updated and peer-reviewed by medical specialists. Regular patient education seminars are convened, featuring guest presentations by ART domain experts, complemented by a question-and-answer segment, thereby affording patients the opportunity to engage directly with these experts for queries.

Furthermore, harnessing digital platforms can augment outreach endeavors; webinars or live-streamed discussions could reach a wider audience transcending geographical boundaries.<sup>14</sup> Social media campaigns aimed at demystifying ART procedures can also play a substantial role in augmenting public knowledge while addressing prevalent misunderstandings surrounding fertility treatments.

### Establish and Fortify Social Support Networks

Given that participants have articulated a longing for social support and broader recognition, healthcare institutions are encouraged to collaborate with established patient support groups to co-host informative events such as health fairs and community-based seminars. To enhance public awareness of ART across various platforms, a comprehensive suite of social media initiatives can be orchestrated. These initiatives aim to foster broader societal discourse and encourage the public to express their solidarity and understanding of ART.<sup>15</sup>

Simultaneously, creating dedicated support networks—both online forums where individuals can share experiences anonymously and in-person groups for those undergoing ART treatment—is crucial for enhancing the emotional well-being of patients.<sup>16</sup> These networks not only offer emotional succor but also facilitate the sharing of practical guidance regarding maneuvering through the intricacies associated with treatment processes.

### Strengthen Privacy Protection and Security Measures

Participants in the study cited concerns about privacy breaches. To effectively address patients' apprehensions about privacy and security, healthcare institutions must enforce stringent privacy protection policies along with robust data security measures that are in compliance with relevant regulations.<sup>17</sup> This includes enhancing training programs for medical personnel to ensure their thorough comprehension of responsibilities related to confidentiality agreements; utilization of advanced encryption technologies to safeguard sensitive patient data during storage and transmission; conduction of regular audits of data handling practices; ensuring secure communication channels among staff members when discussing sensitive cases; explicitly informing patients about how their personal information is protected throughout their care journey; establishment of protocols for prompt reporting of any potential breaches.<sup>18</sup>

Furthermore, it would be highly beneficial if institutions provided clear documentation outlining the specific steps taken to maintain confidentiality during consultations or treatments, thereby instilling a greater sense of security among patients when entrusting their personal information.<sup>19</sup>

### Promote Communication and Cooperation Between Couples

Participants showed their willingness to be the husband's most trusted partner. They actively accepted their husbands, provided them with good support, and set the same goals as their husbands. This shows that healthcare providers should

encourage the joint participation of couples not only in decision-making but throughout every phase of treatment planning by facilitating open dialogues about the expectations that both the medical and emotional aspects might entail for the involved parties during this period. Provision of couple counseling services specifically tailored for those undergoing fertility treatments will assist partners in acquiring the effective communication skills essential when confronted with the challenges that are unique within this context: managing the varying degrees of hopefulness versus anxiety regarding success rates, coping strategies following unsuccessful cycles, and so forth, thereby strengthening the overall partnership bonds.<sup>20</sup>

Workshops focusing on relationship-building exercises could further equip couples with the necessary tools to collectively navigate the difficulties encountered during this journey rather than facing them individually. This ultimately contributes positively to enhancing both the emotional experiences shared together and potentially increasing the chances of achieving the desired outcomes through collaborative efforts.<sup>21</sup>

## Manage Expectations Regarding Treatment Outcomes

Participants are full of concerns about the unknown outcome for assisted reproduction, which may be related to unfulfilled expectations, financial burden or efforts to maintain family relationships. It is also worth paying attention to that passive psychological conditions will have an impact on physiology, such as controlling hormone secretion, which may lead to the failure of assisted reproduction.<sup>22</sup> To address the concerns related to the anticipated results from the diverse forms of assisted reproduction techniques available in the present era, healthcare providers must prioritize ensuring realistic expectations among prospective parents by presenting transparent and comprehensive insights into the possible outcomes associated with each employed method. This involves offering statistical success rates derived from reliable sources along with candid discussions surrounding the risks involved—including physical side effects experienced after certain interventions—as well as the psychological ramifications arising from the fluctuating emotions felt before, during, and after the procedures undertaken.

Additionally, providing psychological support services encompassing individual therapy options coupled with group sessions led by trained professionals specializing in infertility-related matters enables clients to cope effectively and manage the feelings that arise throughout the entire course of care received. By adopting holistic approaches that integrate mental wellness considerations into the standard practice frameworks established within clinics treating infertility conditions, it ensures greater preparedness among families embarking on journeys involving complex decisions that impact their lives and long-term future aspirations held dear.

## Limitations

The limitations of this study are as follows: (1) although our interviews were conducted at a public tertiary hospital that performs over 10,000 in vitro fertilization (IVF) cycles annually, the findings may not be generalizable to all women whose husbands' sperm has been thawed due to the single-center nature of this research; (2) This study exclusively includes women from China. Given the cultural and educational differences, it is important to note that these factors may result in varying outcomes when interviews are applied in other countries. (3) The present study is limited to a sample size of 13 participants due to the cessation of interview updates, which constrains the generalizability of our findings to broader populations. Consequently, the applicability of our research conclusions may be compromised. Future studies should endeavor to enhance the representativeness and universality of their results by augmenting the sample size, thereby fortifying the external validity of the conclusions drawn.

## Conclusion

In this essential research, we conducted an in-depth exploration of the psychological experiences of women who utilized their husbands' thawed testicular sperm for in vitro fertilization on the day of oocyte retrieval. The findings reveal the challenges these women face, their quest for professional knowledge, concerns regarding privacy protection, and anxieties about treatment outcomes. Furthermore, the study underscores the significance of communication between spouses and highlights how shared goals can positively influence family dynamics and marital relationships.

Based on these insights, it is recommended that medical institutions and nursing teams implement strategies to enhance patient education and awareness surrounding assisted reproductive technology. Additionally, establishing and strengthening social support networks, reinforcing privacy protections and safety measures, promoting effective communication between partners, and managing treatment outcome expectations are crucial steps forward. While this study offers valuable perspectives, its limitations indicate a need for future research—particularly discussions surrounding similar topics across diverse cultural and educational contexts. By gaining a deeper understanding of these psychological experiences, healthcare providers can better support couples undergoing assisted reproductive therapy. This approach will help them navigate emotional fluctuations throughout the process, ultimately improving both their overall experience and success rates in treatment.

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## Author Contributions

All authors have contributed significantly to the work described, either in conceptualization, research design, execution, data acquisition, analysis, and interpretation, or in all of these areas. They have been involved in drafting, revising, or critically reviewing the articles, have approved the final version for publication, and have agreed to take responsibility for all aspects of the work. Consensus has been reached on the selection of the journal for article submission.

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## Disclosure

The authors report no conflicts of interest in this work.

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