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ORIGINAL RESEARCH

A Qualitative Study of the Emotional and Decision-Making Experiences of Mothers Whose Daughter Undergoes Assisted Reproductive Technology with Donor Sperm

Qun Wei, Xinyi Yang, Xia Hong, Yu He, Zhuoya Fan, Zilian Wang

Nursing Department, Sir Run Run Shaw Hospital, School of Medicine, Zhejiang University, Hangzhou City, Zhejiang Province, People's Republic of China

Correspondence: Zilian Wang, Nursing Department, Sir Run Run Shaw Hospital, School of Medicine, Zhejiang University, No. 3 Qingchun East Road, Hangzhou City, Zhejiang Province, 310020, People's Republic of China, Email yanchen517@126.com

Objective: To explore the emotional experiences, decision-making dilemmas, and social support needs of mothers whose daughter has used donor sperm in assisted reproduction treatment due to azoospermia in the daughter's partner. The findings will provide a basis for developing clinical education programs and optimising family decision support systems.

Methods: Mothers of 12 female patients undergoing donor sperm assisted reproduction at a A-grade tertiary care reproductive center were selected for semi-structured interviews from January 2025 to March 2025, and Colaizzi's phenomenological analysis was used to distil themes and report them according to COREQ guidelines.

Results: Three core themes and nine sub-themes were identified: (1) the complex emotions of knowing that the daughter's spouse was azoospermia and would need to use donor sperm to conceive, including shock and anger, rationality and tolerance, as well as secret joy and relief; and (2) the multiple concerns about the future relationship between the daughter and her family: the uncertainty of the treatment process and outcome; the potential risk to privacy; the potential impact on the future marital relationship; and the psychological challenge of the identity of the offspring. (3) Comprehensive support and protection for the daughter: manifested in accompaniment to the clinic and financial support, protection of privacy and expectation of sperm selection.

Conclusion: The mother's emotional experience of female patients using donor sperm in assisted reproductive technology (ART) presents complexity and multiplicity, and has a potential impact on the decision-making process of the couple. Therefore, caregivers should consider the psychological characteristics of female patients, their family relationships and the level of support their mothers provide when treating them. They should also provide personalized clinical education programs and information support. Furthermore, they should explore the degree to which mothers are involved in their daughters' decision to use donor sperm. This will improve their decision-making experience and enhance the family's overall satisfaction with the treatment.

Keywords: donor sperm, assisted reproductive technology, mother of the woman, decision making experience, qualitative research

Introduction

In recent years, the decline of human fertility has made infertility a major problem affecting reproductive health. The development of assisted reproductive technology (ART) has provided an feasible solution for patients with infertility to achieve their fertility aspirations.[1] Among them, sperm donor assisted reproductive technologies include artificial insemination with donor sperm (AID) and in vitro fertilization with donor sperm (D-IVF) and embryo transfer. This technology mainly targets men with irreversible azoospermia, severe oligospermia and genetic diseases, and achieves fertility goals by using sperm donated by human sperm banks.[2] Nearly one million families in China are in need of sperm donor technology for their fertility needs.[3] However, women who receive donor sperm for assisted reproduction are faced with changes in traditional kinship and psychological, ethical and social pressures caused by the nontraditional ways of

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conceiving such as AID and D-IVF, and often seek support and advice from their mothers.[4–6] In the traditional Chinese family structure, mothers often take on the role of counsellor in their children's reproductive decisions, and only children in particular tend to rely on their mothers for advice and emotional support.[7] As a result, mothers' emotional experiences during this critical period may have a direct impact on their daughters' adherence to treatment and the stability of family relationships, and mothers also face psychological distress and role adjustment as their daughters go through this reproductive challenge, experiencing complex psychological changes between motherhood and grandmotherhood.[8,9] Therefore, it is important to study the emotional experiences and decision-making dilemmas of mothers in ART. Most of the existing studies focus on the emotional regulation of couples using donor sperm and the ethics of sperm donation,[3,5,10] but there is a lack of research on the emotional and decision-making experiences of female patients' mother, who are the 'invisible decision-makers' in assisted reproduction with sperm donation. This study uses a qualitative research methodology to understand the real psychological experience and decision-making process of mothers during AID and D-IVF treatment.

This study uses a qualitative approach to understand the real psychological experience and decision-making process of mothers during the daughter's AID and D-IVF treatment, with the aim of providing more targeted support and assistance to health professionals, families and society.

Methods

Study Design

This study was guided by the descriptive phenomenological approach in qualitative research,[11] data were collected using face-to-face semi-structured interviews and reported in accordance with COREQ guidelines.[12] The descriptive phenomenology adopted in this study focuses on "going back to the thing itself" and emphasizes the pure experience or "primitive intuition" of mothers whose daughter undergoes donor sperm treatment. Three interviewers had learned and mastered the content of qualitative research and interview skills. The first author, as the main interviewer, has been working in reproductive health for more than ten years and is a clinical experienced associate chief nurse. The other two interviewers were nursing graduate students and assisted in the transcription and analysis of the interview. The interviewers had no assisted reproductive technology treatment history to reduce personal bias; The interviewers participated in the care of the respondents in the diagnosis and treatment process, and established a full trust relationship with the respondents.

Ethical Approval

This study strictly followed the Declaration of Helsinki and was approved by the Medical Ethics Committee of Sir Run Run Shaw Hospital, Zhejiang University School of Medicine (NO.2025–0112). All respondents gave informed consent and volunteered to participate in this study. Personal information was anonymized and only members of the research team had access to the audio recordings and transcripts. Participants could withdraw at any time during the study with no consequences.

Study Participants

Mothers of daughters who received sperm donor assisted reproductive technology treatment at the Reproductive Medicine Center of an A-level tertiary hospital in Zhejiang Province from January 2025 to March 2025 were selected as study subjects.

Inclusion Criteria

a. The age ranged from 40 to 65 years;

b. The daughter received the first assisted reproductive treatment with sperm donation;

c. The doctor-patient communication between the daughter's son-in-law who had participated in the treatment;

d. The mother knew that the son-in-law was diagnosed with azoospermia before or during the treatment of the daughter, and the daughter knew and agreed to the mother's interview with the nurses of the reproductive center.

Exclusion Criteria

a. Hearing, language or cognitive impairment;

b. severe illness or inability to cooperate with the investigators

Withdrawal Criteria

a. The subjects asked to withdraw from the study.;

b. The investigator considered that the subject was not suitable to continue participating in the study.

Sampling

A purposive sampling method was used to select subjects based on maternal age, marital status, education level, occupation, economic status, residence, and treatment plan for their daughters. The sample size was based on the principle of data saturation, that is, the interviews ended when no new themes emerged at the time of data analysis. A total of 16 potential participants were approached in this study, among whom 2 were included in the pre-interview, and 2 patients refused to join due to their unwillingness to self-disclose. Finally, 12 patients were included in this study, and the general information of the respondents is shown in Table 1. To protect the privacy of the respondents, their names were concealed and numbered M1–12 instead.

Research Process

Determining the Outline of the Interviews

A research group was established, including 6 members, all of whom had bachelor's degree or above, including 2 masters of nursing, and all of whom had received qualitative research training. After literature review and discussion by the research group, a preliminary interview outline was formed under the guidance of qualitative research experts. Two patients were selected for pre-interview, and the interview outline was adjusted according to the pre-interview situation, and the formal interview outline was finally formed as follows:

a. How did you learn that your son-in-law had azoospermia? Did your daughter tell you or did she find out by accident? What were your thoughts and feelings when you found out?

b. What do you think of sperm donation? What kind of communication have you had with your daughter and son-in-law?

c. How do you feel about your daughter's sperm donation?

d. What actions would you take in the decision-making and treatment of sperm donation? How can I support my daughter in spirit or action?

e. In the process of sperm donation and assisted pregnancy, what help and protection do you hope to get?

Data Collection and Quality Control methods

Mothers attending the outpatient clinic with their daughters were screened through the medical record system, and those who met the inclusion and exclusion criteria were initially contacted, the purpose of the study, the method, the principle of confidentiality and the necessity of recording were explained, and an interview was scheduled after informed consent was obtained. Three researchers with professional training and interview experience simultaneously conducted face-to-face semi-structured interviews with mothers in a warm and quiet independent clinic. The interview was scheduled with the mother in advance. During the interview, the researchers paid attention to maintaining the neutrality of language, and actively guided and encouraged the interviewees to confirm their views in time. At the same time, listen carefully, encourage respondents to express their true feelings and experiences, avoid hints, and pay attention to observe and record the non-linguistic behaviors such as the expression, speed and intonation of the respondents. The interview time was controlled within 30 to 45 minutes. After the interview, the data were checked with me, and the recording data were transcribed into text and stored in NVivo 11 software within 24 hours after confirmation.

Data Analysis methods

Data collection and data analysis will be conducted simultaneously. After completing an interview, the recording was transcribed into text data on the same day, and the correctness of the transcript was checked by two people. Colaizzi's seven-step analysis method was used for data analysis.[13] The specific steps were:

a. Read all the data carefully;

Table 1 General Information of the Interviewees (n=12)

No.	Age/Years	Educational Level	Occupation	Residence	Marriage	Childbearing Situation	Average Monthly Household Income/Yuan	Daughter's Age/Years	The Daughter's Type of Treatment
M1	45	Senior high school	Clerk	Countryside	Divorced	A daughter	5000–10,000	25	D-IVF
M2	55	Technical secondary school	Clerk	Township	Married	A daughter	5000–10,000	30	AID
M3	53	Junior college	Laborer	Countryside	Married	A daughter and a son	5000–10,000	28	AID
M4	62	Senior high school	Retiree	City	Married	A daughter	10000–15,000	37	AID
M5	60	Bachelor degree	Retiree	City	Married	A daughter	>15000	35	AID
M6	58	Senior high school	Clerk	Township	Divorced	Two daughters	5000–10,000	34	D-IVF
M7	58	Bachelor degree	Clerk	City	Married	A daughter	10000–15,000	30	D-IVF
M8	46	Junior college	Treasurer	Township	Married	A daughter	5000–10,000	23	AID
M9	47	Primary school	Peasantry	Countryside	Married	A daughter and a son	3000–5000	28	AID
M10	63	Master's degree	Retiree	City	Married	A daughter	>15000	38	AID
M11	55	Junior college	Retiree	City	Married	A daughter	>15000	29	AID
M12	51	Bachelor degree	Medical staff	City	Married	A daughter	5000–10,000	26	AID

Notes: D-IVF, in vitro fertilization with donor sperm; AID, artificial insemination with donor sperm.

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b. Extract important statements;
c. Coding recurring concepts;
d. The coded ideas were pooled into themes;
e. Relate the theme to the research phenomenon and describe it completely;
f. Induce similar ideas, sublimate the theme;
g. Return all to the respondents for verification.

The interview data were repeatedly read, sorted out, classified and analyzed by two research group members, and the content was presented to the greatest extent. When there was any disagreement, the research group members discussed and ruled.

Results

Theme 1: Emotional Complexity and Diversity When Knowing the Azoospermia of a Son-in-Law

Participants described complex and multidimensional feelings during ART when they learned that her son-in-law needed donor sperm to have children because of azoospermia.

Shock and Anger

The women's mothers, on learning of their son-in-law's infertility, showed an inability to accept the facts. They were less accepting of this unexpected situation and resisted their daughter's decision to use donor sperm assisted reproductive technology.

M1:

> How is it possible! He (son-in-law) is so tall and fit, how can he have no sperm? Isn't this harming my daughter? I have only one daughter, because he (son-in-law) can't have a child, is it going to make my family have no more offspring?

M3:

> Did he know (that her son-in-law had no sperm)? Is that why he divorced his ex-wife? Why didn't he tell us before? Why should my daughter suffer like this? Leave him while she is young!

M7:

> It was so unexpected! The couple have been married for 5 years and have told me that they are on contraception and don't want children, and it's actually because he (the son-in-law) can't do it!

M4:

> Her mother-in-law has always thought that if the young couple don't have children, the problem must lie with my daughter, and we'll see how her mother-in-law explains it later (with a scornful expression). All the costs of doing (donor sperm) this should be made to come out of the mother-in-law's family!

M11:

> My son-in-law is the one I chose for my daughter, he's 190cm tall, fair-skinned, good-looking and has a good job, the key is that he's a hard worker and a good basketball player, it's really unexpected!

Rationality and Tolerance

When the daughter needed donor sperm for a pregnancy after learning that her son-in-law had azoospermia, some mothers showed deep care and rational thinking, especially when their daughter expressed fear of ART and was considering divorce.

M5:

> I advise my daughter to calm down and think carefully about the good qualities of the son-in-law, he has been very considerate to you; And, while IVF can be painful, it is short-lived and finding a new partner can bring more uncertainty.

M8 expressed her understanding and support for her son-in-law:

My son-in-law is very filial to my husband and I. I know he loves children very much, and he feels very guilty about his lack of sperm, and my husband and I will fully support them to do so to ensure their little family is happy!

M10:

I believe they have thought through all aspects of the use of sperm, and I told my daughter that I will support her no matter what choice she makes.

Secret Joy and Relief

The mothers' attitudes toward the use of donor sperm showed their concern for the future happiness of their daughters, their expectations for the characteristics of the ideal partner, and their deep reflection on the family education and cultural background. At the same time, they showed a potential pleasure and relief in the process of supporting of ART using the donor sperm.

M2:

My son-in-law is an average looking man, only 5'6", and the small eyes in particular have always put me off. I often worry that these features will be passed on to the next generation, but I am sure the children born using donor sperm will be better looking than he is (expression full of smiles).

M5:

I was always worried that my son-in-law's baldness and dry skin condition would be passed on to his children. The fact that using donor sperm will allow their children to avoid these health problems gives me peace of mind. (shows happy face)

M6:

The little couple were married for 7 years, always said that they did not want to have children, I urged every day, only then my daughter told me (son-in-law has no sperm). Now I'm glad to find out the cause of infertility. Only a family with children can be complete.

M9:

My son-in-law's low education and limited learning ability make him suitable only for some manual work. If you choose to use someone else's sperm, I believe the baby's genes will be better, which will compensate for the lack of a son-in-law, and their offspring will be better.

Theme 2: Multiple Concerns About Daughter and Her Marital Relationship

Regarding their daughters' choice of sperm donation technology, the mothers' concerns mainly focused on the treatment outcome, marital stability, family structure, privacy protection and future children's identity, which reflected their deep concern for their daughters' future family happiness.

Concerns About the Uncertainty of Treatment Process and Outcome

The mother showed significant concern for her daughter's physical health and psychological state during the process involving sperm donor treatment. They were not only concerned about the safety of the treatment, but also expressed concerns about the success rate, potential physical side effects, and their daughter's ability to adapt to the treatment process.

M4:

Will the sperm donation technology cause harm to my daughter's body? She is 37 years old and the doctors say her ovaries are not functioning well and the number of eggs is not high, does that mean the success rate is not high?

M1:

My daughter is very afraid of going to the hospital and has never had an injection except for preventive shots. I've heard that IVF requires a lot of injections, and I'm worried that she won't be able to handle it mentally or physically.

M3:

My daughter may need to try many times to succeed, which will increase the financial burden, and she will not be able to work for a while. I wonder if she can bear the cost.

M7:

I am worried that the sperm donor technique will affect my daughter's endocrine system as she is not normally in good health and I am not sure if she will be able to cope with the ovulation induction treatment.

Concerns About the Risk of Privacy Breaches

Mothers' concerns relate to the protection of personal information, the family's reputation and the mental health of future children. They hope to create a safe and harmonious living environment for their daughters and future children, and to avoid social pressure and potential risks caused by privacy leakage.

M8:

We live in a small town, everyone knows each other, once everyone knows, it will definitely be talked about, how the daughter, son-in-law and future children can stay here.

M10:

I am worried that if my grandchildren are ridiculed or discriminated against in school because the father is not their real father, it is unfair to the kid.

M6:

My son-in-law's family business is doing very well, and if my son-in-law's lack of sperm and my daughter's use of a sperm donor someday became known, she would certainly face pressure and questions from the family. It would affect the prestige and future of my daughter and son-in-law in the company.

M8:

A large piece of land in my son-in-law's family will be expropriated, and if my son-in-law's brother learns in the future that the child is not related to my son-in-law by blood, I am worried that the kid will not be able to fight for the right to inherit the land in the future.

M3:

My neighbor's daughter works in your hospital. Will she check the information about my daughter's sperm donor?

Concerns About Changes in Her Daughter's Marriage

The mother was worried about the impact of the daughter's use of donor sperm on her future marriage relationship and feared that communication and understanding between the daughter and son-in-law would lead to tension or disharmony in the couple's relationship.

M6:

My son-in-law doesn't have a strong obsession with having children, but my daughter insists on having one. The child is not related to him by blood, will he accept and like the child?

M4:

I am afraid that if the child does not look like the father, or if the child is not naturally close to him, then the family will not be able to be as close and harmonious as in other families.

M3:

Sperm donor treatment is expensive and if we spend all our savings and do not succeed in getting pregnant, I am worried that her life will become more difficult and it may cause marital tension.

M11:

The roles of family members change after using donor sperm and I am worried that in the future my daughter and son-in-law will be at odds because of their different views on how to raise and educate their children, which in turn will affect the stability of their marriage.

Concerns About the Identity of the Offspring

Mothers show deep concern about the identity of the children born to their daughters using donor sperm technology, which is reflected in the legal and economic aspects of the blood relationship; and the emotional challenges that the children may face in their family and social environments.

M6:

If they have a child in the future but get divorced, the custody of the child should go to the woman, right? What should the we do if he refuses to pay maintenance because he is not a blood relative?

M4:

I am worried that the grandparents will treat the child differently when the child is born - after all, the child is not their biological grandchild and there may be prejudices.

M11:

If the child does not look like their parents, it will always be reminded that the child was born by sperm donation. And if the child needs a blood transfusion or something like that when they grow up, they might know their biological relationship to their parents.

M7:

If the couple has a bad relationship in the future, the children will suffer the most. Lay down the rules upfront, then play nice. So, in order to prevent possible future disputes, I suggest that they first consult a notary to make sure that the distribution of property and maintenance is legally protected. This will reduce disputes and protect the interests of the child.

Theme 3: Treatment Decision-Making Interventions and Support

In traditional Chinese culture, the concept of filial piety emphasizes family and affection, and mothers, as the core of the family, want to help their daughters make comprehensive and considered choices in major life decisions through companionship and financial support, especially in assisted reproduction processes involving fertility and family.

Accompaniment and Economic Support

Many mothers choose to accompany their daughters to the hospital during their assisted reproduction treatment. This accompaniment is not only a form of emotional support, but also a way of gaining information. Mothers can learn every detail of the treatment process so that they can better advise and assist their daughters.

M6:

I would go with her to the hospital every time to listen to the doctors and understand the treatment options. That way I would feel more comfortable and also give her encouragement and support if she hesitates.

M10:

I stayed in her home during this time, helping her cook, managing her diet, supervising her regular routine and trying to create a comfortable and de-stressing environment for her.

M5:

It's not cheap and I'll do everything I can to support her so that she doesn't have to give up her fertility treatment for financial reasons.

Support for Treatment Selection

The role of mothers in the donor sperm treatment process is not only that of supporter, but also that of protector. They are concerned that their daughters' personal information, medical records and reasons for choosing donor insemination may become known to others, which could affect the family's social image and the individual's mental health.

M6:

In order to ensure my daughter's privacy, my daughter and I contacted the doctor in charge and asked about the hospital's privacy policy and requested that the hospital not disclose any information, including to my husband, who should not know the news.

M8:

I reminded my daughter to dispose of information related to her hospital visits, including medical records and payment receipts, before returning to each hospital so that outsiders would not know about them.

M9:

I took the initiative to ask the doctor in charge to be involved in the selection of the donor sperm, hoping to get good sperm from a well-educated, healthy and good-looking donor.

M12:

I would like to know if the hospital can provide support to check if the child is related to the person in order to avoid consanguineous marriage when the child is old enough to talk about marriage.

Psychological Support for Daughters

Mothers help their daughters to cope better with the challenges of the treatment process, reduce anxiety and increase confidence through emotional care and positive communication styles during their daughters' treatment.

M10:

I will talk to her regularly, listen to her feelings and concerns and let her know that I will always be there to support her.

M5:

I found some success stories online and told her that many people have gone through this process and ended up happy. That way she won't feel alone and she'll know she's not the only one.

M11:

Whenever she gets frustrated, I tell her how brave and strong she is and that I am sure she will succeed.

M6:

I would do some relaxation exercises with her, such as deep breathing or meditation, to help her reduce stress and cope better with the challenges of the treatment process.

Discussion

Attending to the Mother's Psychological State and Providing Personalized Emotional Support Strategies

At present, research on the mental health of infertile patients focuses primarily on the psychological status of the couple, while relatively little research has been done on the psychological status and emotional experience of the mother, who is an important source of emotional support for the female patient.[14–17] The present study set out to explore the emotional responses of the mother of the female partner when she became aware that her son-in-law was azoospermia and required the use of a donor sperm to fulfil her daughter's desire to have a child with him. The emotional reactions of the mother fell into three distinct categories: shock and anger, rationality and tolerance, as well as secret joy and relief. The variation in these emotional responses highlights significant disparities in individual psychological attributes, understanding of infertility, and attitudes towards sperm donation.[18,19] Therefore, it is important to understand the emotional experience and psychological state of mothers of female patients in order to provide more comprehensive psychological support and interventions, and to help infertile donor families make more reasonable fertility choices.[20] It is incumbent upon the medical staff to formulate suitable emotional support strategies in line with the mother's level of education and her ability to comprehend, to actively listen to her emotional needs and concerns by means of face-to-face communication, and to provide psychological counselling and mental health lectures with the participation of family members so that she can feel concerned and respected.[21] In this process, medical personnel can facilitate mothers' understanding of the ethics of sperm donor insemination, the treatment process, precautions, relevant laws and regulations, and so forth. This can be achieved through the utilization of various educational tools, including information brochures, health education videos, and online platforms.[22,23]

Deepening Understanding of Women's Family Support Needs and Exploring the Role of Mothers in Fertility Decision-Making

The decision-making process for donor sperm assisted reproduction treatment, as a specific socio-culturally constructed treatment, involves not only the couple, but also the support of both families, with the woman's mother, in particular, playing a crucial role.[24] The findings of this study indicate that the impact of mothers on their daughters' decision-making process regarding donor sperm is characterized by a combination of positive and potentially adverse influences. These influences are thought to be shaped by traditional concepts of fertility, cultural backgrounds, and marital experiences.[25] On the one hand, mothers are able to provide their daughters with the necessary emotional and financial support,[26] especially when they are faced with the uncertainty and psychological stress associated with donor sperm, and their support and protection can significantly reduce their daughters' anxiety and increase their confidence in the treatment process.[7,8] On the other hand, mothers often expressed concerns about the complicated medical procedures their daughters underwent, such as salpingography, artificial insemination, ovarian stimulation, oocyte retrieval, and embryo transfer, and worried about their daughters' future.[27,28] For example, a mother may worry about the unhappiness her daughter faces after marriage and the possible problems of child support and belonging caused by the breakup of the couple's relationship.[29,30] This concern will increase dissatisfaction with the son-in-law, which will complicate the decision of the daughter and son-in-law to use donor sperm for pregnancy, which will cause tension in the daughter's family relationship.[31] To effectively manage the mother's involvement in their daughters' decision-making, medical professionals must encourage couples to carefully consider the need for emotional support against the desire for privacy when deciding whether to inform the mother of female patients about donor sperm treatment. In order to understand the mother's attitudes and their possible impact, family structures and relationships must be assessed, thus enabling the design of individualized family support strategies for the couple.[32] Furthermore, it is imperative that health professionals maintain an impartial stance throughout the process, demonstrating respect for the emotional requirements and the prerogative of the couple to reach a decision. This encompasses the decision of whether to inform the mother or to maintain confidentiality. Additionally, it is essential to provide a secure environment that fosters autonomy, enabling the couple to select the decision-making method that most aligns with their preferences.[33]

Strengthening Healthcare Workers' Awareness of Privacy Protection to Alleviate Mothers' Concerns About Privacy Breaches

Research undertaken in both domestic and international contexts has demonstrated that a significant proportion of individuals experiencing infertility encounter issues related to discrimination and shame within their respective social and familial environments.[34–36] This phenomenon has been found to exert a detrimental influence on the mental well-being of the affected individuals, with the potential to engender interpersonal tensions within marital relationships, thereby compromising the quality of the relationship itself.[37] A particular concern pertains to women who have recourse to sperm donor assistance in conception, a demographic that faces a heightened degree of psychological, social, ethical, and moral pressure when compared to other infertility patients. This heightened pressure can be attributed to the distinctive nature of the sperm source employed in their treatment.[38] Research has indicated that such women encounter significant challenges in adapting to married life and are predisposed to an elevated risk of divorce.[36] This study found that women participating in sperm donor treatment, their partners, and their mothers generally placed a high value on privacy protection and expressed great concern about the risk of privacy disclosure. It is therefore important for medical institutions to strengthen medical staff's awareness of the protection of patients' privacy, not only out of respect for patients' privacy, but also in order to maintain the level of trust in the doctor-patient relationship. It is imperative to recognize that any breach in confidentiality, whether intentional or inadvertent, can have severe legal ramifications for medical staff, potentially eroding the trust patients and their families place in the healthcare organisation.[39] Consequently, medical institutions are obliged to adhere strictly to the Code of Practice for Assisted Human Reproduction Technology and the Ethical Principles for Assisted Human Reproduction Technology and Human Sperm Banks, in addition to other pertinent regulations.[40] They must establish and implement an effective privacy protection system, with the aim of minimizing unnecessary doctor-patient disputes.

In the context of the 'Internet Plus' initiative and the rapid advancements in artificial intelligence (AI), there is a growing imperative for medical institutions to enhance the security protocols of their electronic medical record systems. This enhancement aims to ensure the comprehensive protection of patient information across all facets of medical consultations, guidance, treatment registries, and health education. In addition to this, medical institutions are strongly advised to adhere to the stipulated requirements of the Recommendation on the Ethical Issues of Artificial Intelligence when employing AI-assisted reproduction technology.[41,42] This entails the encryption of sperm supply data and the implementation of stringent access control measures to bolster data security. Regular targeted training and educational initiatives should be provided to medical staff, emphasizing the significance of privacy protection and the legal obligations. These measures are crucial to enhance the awareness of medical workers regarding privacy protection and to ensure compliance with the relevant laws and regulations.

Multi-channel health education programs, the Internet and new media platforms represent a multifaceted approach that healthcare providers can utilize to address the needs of patients in the field of reproductive medicine. Beyond the provision of essential knowledge, these initiatives also seek to enhance social support and foster positive doctor-patient relations.[43] The implementation of these strategies has been shown to alleviate fear, tension and shame experienced by patients and their families during the treatment process, thereby promoting a more conducive environment for treatment. The enhancement of public health literacy and the dissolution of the constraints imposed by traditional attitudes are pivotal in fostering a more profound understanding and inclusivity towards donor sperm assisted conception within society. This progressive shift is poised to engender a more compassionate and supportive environment, thereby promoting the psychological well-being of patients and enhancing their confidence and satisfaction throughout the treatment process.[23]

Limitations

The present study is subject to several limitations. Firstly, the majority of the treatments received by the respondents' daughters were AID, with only a few cases of D-IVF. There were differences in the treatments that the women needed to undergo between the two treatments; the women who received D-IVF underwent an additional egg retrieval surgery, which resulted in a more protracted and intricate treatment process and may have had an impact on the psychological

experience and decision-making, which could be investigated in future studies. Secondly, patients were from only one reproductive center, which may have led to selective bias. In the future, multi-center and larger sample sizes will be conducted, and random sampling methods will be used to conduct a multi-regional and multi-center study to increase the reliability of the results. Finally, the present study exclusively examined the emotional experience and decision-making process of the female patients' mothers. Subsequent research could broaden the perspective to encompass the patients themselves and other relatives, thereby facilitating a more comprehensive understanding of the potential influencing factors in the decision-making process of sperm-assisted conception. This would provide a foundation for enhancing the experience of sperm-assisted conception and interventions, and consequently increasing the fertility intentions and quality of life of the patients.

Conclusions

This study utilized semi-structured interviews with 12 mothers whose daughter had undergone ART treatment, with the objective of comprehending their genuine sentiments during the period of discerning and deliberating on their daughter's necessity for ART treatment. The study posits that medical professionals ought to be cognizant of the potential mental health challenges faced by those mothers who assume an invisible role in their daughters' reproductive decision-making and treatment processes. It is recommended that these mothers be offered bespoke emotional support strategies. The study's findings contribute to the exploration of the role of mothers in reproductive decision-making according to the needs of women, with a view to improving awareness of privacy protection, reducing the mother's concern about privacy disclosure, and enhancing the confidence and satisfaction of the entire family during the treatment process.

Patient Consent

After explaining the purpose and content of the study to the patients, the informed consent of the patients was obtained for this study, and the paper version of the informed consent was signed. All patient information will be anonymized in the study to eliminate the risk of privacy disclosure. All patients have given consent for publication of anonymous responses and direct quotes.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare that there is no potential conflict of interest in this work.

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