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# The Experiences and Needs of Chinese Parents of Children With Cancer in Fertility Preservation Decision-Making: A Qualitative Study

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## ABSTRACT

**Purpose:** To explore the experiences and needs of parents of children with cancer when making fertility preservation decisions and provide a basis for the development of targeted decision-making aids.

**Methods:** Guided by the Ottawa Decision Support Framework, a descriptive qualitative study was conducted from May to August 2025. Fifteen parents of children with cancer were purposively recruited to participate in semistructured, in-depth interviews. Data were analyzed using content analysis to systematically identify, categorize, and synthesize key themes.

**Results:** This study extracted three overarching themes and nine corresponding subthemes. Theme one, lack of information before decision-making, encompassed subthemes of limited energy restricting active information seeking, cognitive misconceptions, and lack of professional information sources. Theme two, value preferences during decision-making, which included subthemes of prioritizing life preservation, ensuring safety and efficacy, and shifting reproductive attitudes. Theme three, decision conflicts and regret, comprised subthemes of delayed information access, uncertainty regarding gonadal-damage risks, and loss of children's reproductive rights.

**Conclusions:** The study findings indicate that the decision not to pursue fertility preservation among parents of children with cancer is closely linked to multiple sources of conflict and unmet needs during the decision-making process. Parents often prioritize their child's immediate, life-saving treatment and may subsequently experience decisional regret upon recognizing the importance of fertility preservation. These results highlight the need for healthcare providers to proactively identify and address parental decisional conflicts, providing tailored support in terms of knowledge, information, and counseling, thereby improving the overall quality of decision-making.

## 1 | Introduction

The population of childhood cancer survivors is growing due to advances in treatment strategies and improvement in survival rates [1]. Cancer treatment, such as radiation to the pelvis and brain, and chemotherapy regimens containing alkylating agents can potentially cause high levels of damage to germ cells and affect reproductive hormone production [2]. This gonadal damage may lead to higher rates of premature ovarian failure and azoospermia compared with the general population, resulting in

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early menopause or sterility [3]. Their family planning is often interrupted, with lower rates of pregnancy reported in childhood cancer survivors, for example, compared with sibling cohorts [4]. Actual or threatened infertility in children who are cancer survivors is a source of significant distress and may severely impact quality of life into survivorship [5]. It is therefore important that cancer patients are adequately supported to preserve their reproductive health throughout cancer treatment.

There are a number of fertility preservation (FP) treatment approaches recommended for cancer patients, which differ in their level of recommendation [6]. Since the patients are minors, parents hold the primary decision-making power regarding FP in children, particularly in China. FP decisions are complex and influenced by various medical, psychosocial, and cultural factors [7]. Parents often face complex decision-making situations before cancer treatment. International guidelines recommend that risks to fertility and options for preservation are discussed with patients as early as possible to allow them adequate time for decision-making [8]. However, a significant body of research indicates that there remains a lack of fertility counseling for children with cancer and their parents, and that parents often lack knowledge and decision-making support regarding FP [9–11].

Studies highlight that parents of pediatric cancer patients often experience considerable decisional conflict when faced with FP options for their children [12]. These decisions must often be made under substantial time pressure, shortly after diagnosis, when parents are already coping with overwhelming emotional distress and concern for their child's survival [13]. In this context, fertility-related decisions are frequently deprioritized in favor of immediate life-saving treatment, which may contribute to later regret or feelings of missed opportunities [14]. Furthermore, parental decisions are influenced by multiple considerations, including the child's prognosis, perceived benefits and risks of FP procedures, potential financial costs, ethical concerns about experimental techniques, and religious or cultural considerations [13, 15, 16].

Although these challenges appear to be relatively universal across healthcare systems, cultural and social contexts may shape how families interpret and respond to FP decisions. In China, where parents generally assume primary responsibility for medical decision-making for minors and where fertility and lineage continuation hold strong cultural significance, parents may face unique considerations when confronted with FP decisions for their children. However, empirical studies exploring Chinese parents' experiences and needs during FP decision-making remain limited. Cheng et al. [17] explored Chinese parents' perceptions of infertility risks in children with cancer, but their study did not focus on parents' experiences and needs during the decision-making process.

The Ottawa Decision Support Framework (ODSF) is a widely applied evidence-based framework designed to assist patients and their families in making high-quality decisions in complex healthcare contexts [18]. It systematically evaluates individuals' decisional needs, identifies gaps in knowledge, value clarification, outcome expectations, and emotional or social support, and provides targeted interventions to reduce decisional conflict and enhance decision quality [19, 20]. Guided by the ODSF, the present qualitative study aims to explore the experiences and needs of parents of children with cancer when making FP decisions. By examining the emotional, informational, and contextual factors that shape parental decision-making, this study seeks to contribute to the limited evidence from China while providing insights that may inform culturally appropriate decision support strategies and improve FP counseling for children with cancer and their families.

## 2 | Methods

### 2.1 | Study Design

This study employed a descriptive qualitative research design. Descriptive qualitative research uses flexible strategies in sampling, data collection, and data analysis, aiming to directly present reality through low-inference interpretation (describing experiences or events) and utilize everyday language as a qualitative research methodology [21].

This study used directed content analysis to examine the data [22]. This methodology takes a top-down, concept-driven approach for textual data analysis. It verifies existing theories or utilizes models to explain the phenomena under investigation from the collected data, thereby achieving a progression from theory to data and from abstraction to concreteness [23].

This study utilizes the ODSF as its theoretical framework, where the decision-making requirements within the framework can be directly used as initial coding categories, ensuring a close integration of data with theory [24].

Furthermore, this study adheres to the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist to enhance methodological transparency and rigor in the reporting of qualitative research [25].

### 2.2 | Context of Study

The study was conducted within the Oncology Department of a hospital in China. This public hospital serves as the regional pediatric medical center for Central and Southern China, and its comprehensive women's and children's healthcare services have consistently ranked first in the region.

### 2.3 | Study Population

This study employed purposive sampling to select parents of children with cancer who took their children to the pediatric oncology department between May and August 2025 as research subjects. Consideration was given to factors such as the child's age, gender, parental educational attainment, household monthly income per capita, disease type, and treatment regimen in order to implement maximum diversity sampling, thereby ensuring the inclusion of a diverse range of research subjects.

Inclusion criteria for study subjects: (1) the patient is aged $\leq$ 18 years and diagnosed with a malignant tumor following pathological examination; (2) the child's parents are the child's guardians and primary carergivers, have normal cognitive function and communication abilities, and have given their informed consent, voluntarily agreeing to participate in the interview. Exclusion criteria: (1) the child is in a critical phase of the disease; (2) the child's parents suffer from severe heart, brain, or lung dysfunction.

The sample size is determined by the principle of information saturation, meaning that during data collection, when the information from participants repeatedly overlaps and no new themes emerge even with additional participants, it indicates that the data has reached a state of saturation [26]. Data saturation was reached after 13 interviews, as no new themes or categories emerged. To ensure the robustness of this finding, 2 additional interviews were conducted, which likewise yielded no new insights. Consequently, the final analysis was based on data from all 15 participants.

## 2.4 | Data Collection

Through a literature review [27–30], an interview outline was developed based on the steps proposed by Kallio et al. [31] for creating semistructured interview guides. The outline was subsequently refined and optimized according to discussions among the research team members. This interview outline was developed under the guidance of ODSF. The initial questions were deliberately simple and open-ended to facilitate interviewees in responding comfortably based on their personal experiences. It comprised six dimensions: knowledge and expectations, decision types, decision conflict, values, support and resources, and personal and clinical needs. See Table 1.

This study employed a semistructured one-to-one interview approach for data collection. Researchers provided detailed explanations of the study's objectives, specific content, and implementation procedures to eligible parents of children with cancer. After obtaining participants' informed consent, interview appointments were scheduled. With the approval of the departmental supervisor, the interview locations were arranged in quiet and undisturbed meeting rooms to ensure the smooth conduct of the interviews. Interviews were conducted when the research subjects' physical conditions permitted and at a suitable time. To facilitate the interviews, the researcher prepared the interview outlines and recording equipment in advance. Throughout the interview process, the researcher recorded the entire conversation while simultaneously taking notes on key information. Additionally, we observed nonverbal cues such as the interviewee's facial expressions and tone of voice to capture the essence of the discussions. After the interview, the researcher inquired about the interviewee's overall impressions of the process and solicited suggestions for improvement in subsequent interviews. Contact details were also collected for the purpose of supplementing and verifying information at a later stage.

## 2.5 | Data Analysis

To safeguard participants' privacy, this study employed numeric codes instead of real names. Audio recordings from each interview were transcribed verbatim into text within 24 h, with accuracy ensured through iterative validation. All interviews and subsequent data transcriptions were conducted by the same individual to minimize potential bias and confounding variables. The data were analyzed using directed content analysis [22]. The specific steps are shown in Figure 1.

To ensure the credibility of the analytical process, two researchers conducted the data analysis independently. At this stage, the researchers bracketed their own thoughts and emotions regarding FP, striving to explore the phenomenon from the participants' perspective free from any preexisting biases. Furthermore, to ensure the validity of the analytical findings, when consensus could not be reached, a third researcher reviewed the transcripts and participated in the consensus resolution process.

## 2.6 | Researchers Reflexivity

All researchers involved in data analysis were female and possessed master's-level training in qualitative research methodologies. As nursing trainees in the institution's oncology department, they acquired substantive experience in caring for children with cancer and providing health education. This background endowed the researchers with essential communication skills for interacting with children and their families, facilitating the establishment of strong rapport with interviewees. Prior to the investigation, researchers extensively engaged with qualitative research literature, such as Doing Qualitative Research: The Craft of Naturalistic Inquiry [32], and participated in various qualitative research workshops and specialized lectures. Through this learning process, the researchers progressively developed a comprehensive knowledge system of qualitative research. They achieved significant improvements in both theoretical knowledge and practical skills, including building interview relationships, information extraction, and data processing. This laid a solid foundation for subsequent research endeavors.

**TABLE 1** | Study dimensions and thematic questions.

| Study dimensions | Thematic questions |
|---|---|
| Decision type | Who makes medical decisions in your family? Why? |
| Knowledge and expectations | Are you aware of how your child's treatment plan may affect fertility? What do you think about this matter? |
| Values | What do you think fertility means for your child? |
| Individual and clinical requirements | What do you think about fertility preservation for your child at this time? When selecting or considering fertility preservation methods, what factors do you primarily take into account? |
| Decision conflict | What difficulties did you encounter when making the decision? How did you feel about this? |
| Support and resources | Do you consider information on fertility preservation important? Why? What further assistance might you require at this time? When? And why? |

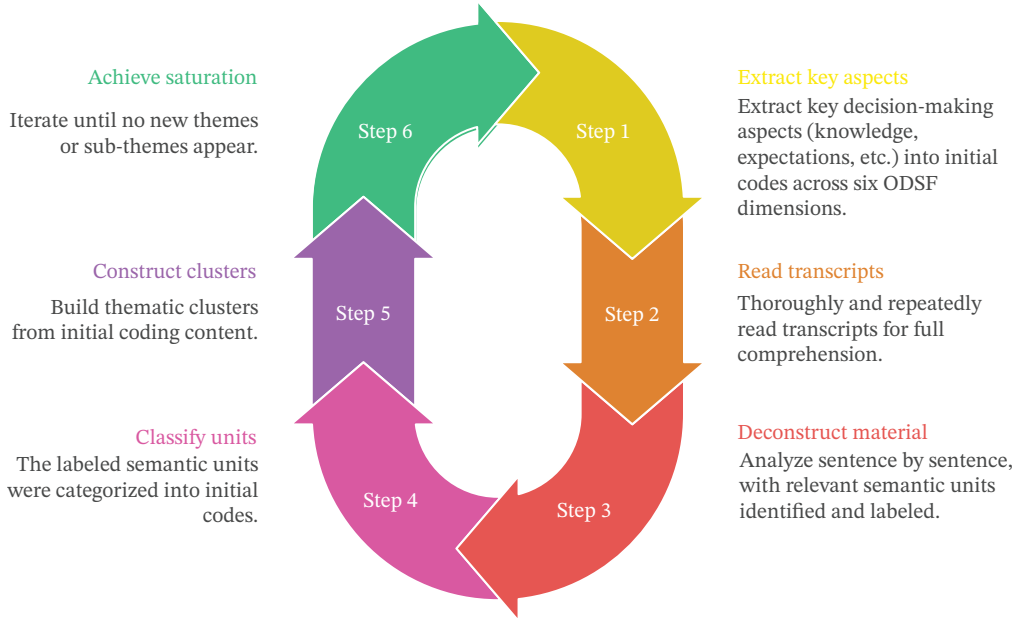


**FIGURE 1** | Steps of the directed content analysis process.

## 2.7 | Ethical Considerations

This study was approved by the Clinical Research Ethics Committee of the hospital in China ([2024] No.426A01). All participants voluntarily took part after signing an informed consent form. All written and audio materials are securely stored and accessible only to the research team to ensure the confidentiality of the information. Any references to individuals or organizations that might identify the interviewees have been redacted from the transcripts. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and relevant national guidelines.

## 3 | Results

Fifteen parents of children with cancer who were eligible as study participants agreed to participate. Therefore, 15 qualitative, semistructured individual interviews were conducted, lasting on average 28 min.

A total of 15 respondents were included in the study, all of whom had actively declined FP. Among them, 11 were mothers and 4 were fathers. The mothers' ages ranged from 25 to 41 years (mean $34.64 \pm 5.32$ years), while the fathers' ages ranged from 31 to 45 years (mean $37.25 \pm 7.21$ years). The children's ages ranged from 1 to 16 years (mean $8.47 \pm 4.20$ years), including 9 boys and 6 girls. To protect participant privacy, participants are identified by codes in the table. See Table 2.

Three major themes and nine subthemes emerge from the interviews. The specific content is shown in Figure 2.

## 3.1 | Lack of Information Before Decision-Making

This theme encompasses three subthemes: limited energy restricting active information seeking, cognitive misconceptions, and lack of professional information sources. Parents of children with cancer indicated that, given their limited knowledge of FP, they wished to receive more comprehensive informational support as soon as possible after their child's cancer diagnosis to better inform their decision-making.

### 3.1.1 | Limited Energy Restricting Active Information Seeking

In the early stages of a cancer diagnosis, parents focus most of their energy on whether their child will survive, and rarely consider the potential long-term effects of cancer treatment on fertility. Consequently, they do not proactively seek information about FP. A4: "I'm usually very busy with work, and now my child has leukemia... My energy is limited at present. I'm not concerned with relatively secondary matters like fertility. It would be helpful if you could provide that information." A6: "I'm not actively seeking this information now; our focus is entirely on her treatment."

Despite recognizing the importance of information regarding FP, parents often find themselves unable to independently seek out resources due to the demands of caring for their child. They hope healthcare professionals (HP) will proactively and timely provide this information following a diagnosis, allowing sufficient time for decision-making. A11: "Immediately after diagnosis, we were utterly overwhelmed. We simply had no time to seek this information ourselves... FP details are vital. If healthcare staff communicated this promptly, many parents would gain the necessary breathing space to consider this decision." A14: "FP is crucial; it determines whether he can have children in the future. I need you to inform me about how treatment might impact his future fertility and what steps can be taken to protect it."

### 3.1.2 | Cognitive Misconceptions

Parents of children with cancer exhibit a systematic underestimation or denial of the fertility-compromising risks associated with treatment, leading them to actively avoid seeking such information on FP. A2: "Nowadays radiotherapy is targeted; doctors don't administer it to the entire body, so it shouldn't

**TABLE 2** | Description of study participants and patients (participants $n = 15$).

| Encoding | Participant information | | | | Patient information | | |
|---|---|---|---|---|---|---|---|
| | Gender | Age (years) | Educational background | Per capita monthly household income (RMB) | Gender | Age (years) | Diagnosed |
| A1 | Female | 38 | Junior College | 5000 | Male | 11 | Burkitt lymphoma |
| A2 | Male | 45 | Senior High School | 0 | Male | 16 | T-lymphoblastic leukemia |
| A3 | Male | 31 | Senior High School | 3000 | Male | 4 | Acute lymphoblastic leukemia |
| A4 | Male | 35 | Postgraduate | 35,000 | Male | 4 | Acute lymphoblastic leukemia |
| A5 | Female | 28 | Senior High School | 5000 | Female | 10 | T-lymphoblastic leukemia |
| A6 | Female | 40 | Senior High School | 1000 | Female | 9 | Acute lymphoblastic leukemia |
| A7 | Female | 40 | Junior College | 1000 | Female | 13 | Acute myeloid leukemia |
| A8 | Female | 41 | Junior High School | 5000 | Female | 10 | Acute myeloid leukemia |
| A9 | Female | 37 | Junior College | 2000 | Male | 13 | Acute myeloid leukemia |
| A10 | Female | 30 | bachelor's degree | 10,000 | Female | 4 | Neuroblastoma |
| A11 | Female | 36 | bachelor's degree | 4000 | Female | 12 | Acute myeloid leukemia |
| A12 | Female | 25 | Junior College | 8000 | Male | 1 | Nephroblastoma |
| A13 | Male | 38 | bachelor's degree | 8000 | Male | 6 | Germinoma |
| A14 | Female | 34 | Junior College | 30,000 | Male | 4 | Chondrosarcoma |
| A15 | Female | 32 | Senior High School | 5000 | Male | 10 | Germinoma |

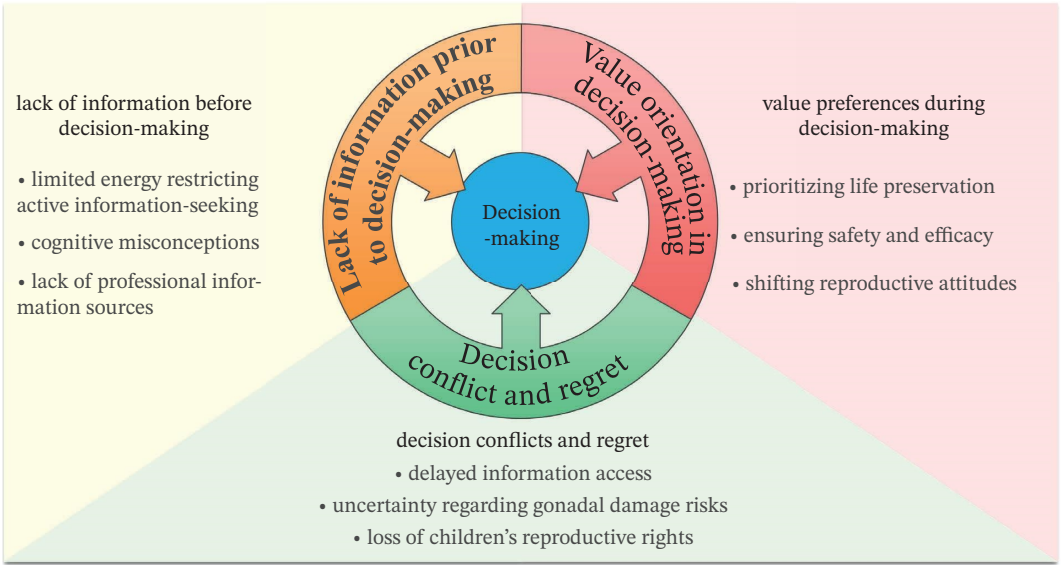


**FIGURE 2** | Thematic presentation.

cause harm." A3: "I believed the treatment wouldn't affect fertility, so I didn't look into FP."

Certain types of cancer treatments may cause irreversible damage to fertility immediately after administration. Delaying consideration of FP until adolescence or when future reproductive needs arise may result in missing the optimal window for intervention, leading to irreparable loss of fertility. A4: "We'll address fertility issues when they arise." A13: "The primary focus now remains on controlling his tumor. I will only explore fertility-related information when he requires it, such as during puberty."

Some parents view FP and cancer treatment as mutually exclusive options, believing that undergoing FP may delay their child's treatment and thereby jeopardize the child's life. A7: "It's simply not feasible to delay treatment for the sake of future fertility when the child's very survival is at stake." A10: "Nor can one argue that treatment should be withheld solely to preserve fertility; that too is untenable."

### 3.1.3 | Lack of Professional Information Sources

Participants primarily obtain information about FP through two channels: fellow patients and online search engines. While these sources are extensive and readily accessible, they also have significant limitations. For instance, patient-shared experiences are largely anecdotal; online information is overwhelmingly complex, making it difficult for parents to discern its accuracy and often leading to confusion and uncertainty. A7: "Sometimes it's family members from the same ward or patient group; other times we discuss it within patient support groups." A15: "I mainly searched online myself, though I couldn't tell whether what they said was accurate."

The demanding clinical workload of HP reduces parents' willingness to proactively seek FP-related advice from specialists. Simultaneously, limited one-to-one consultation time and high information density make it challenging for parents to fully comprehend and retain relevant details under stressful circumstances. Consequently, they express a strong preference for healthcare teams to convey FP information through standardized, easily accessible educational mediums such as videos and leaflets. A9: "Every doctor is so busy. It would be much better if there were leaflets or videos so everyone could learn about it themselves." A8: "Videos or leaflets would be easier to understand. With one-to-one discussions, you might forget it all afterwards. You can watch videos repeatedly on your phone, and leaflets can be referred to anytime. Written and video information would be more comprehensive and accurate."

## 3.2 | Value Preferences During Decision-Making

This theme encompasses three subthemes: prioritizing life preservation, ensuring safety and efficacy, and shifting reproductive attitudes. Parents of children with cancer make decisions based on their personal values, carefully weighing the benefits, risks, and uncertainties currently associated with the available FP options.

### 3.2.1 | Prioritizing Life Preservation

During the medical decision-making process, parents universally prioritize treating the disease and saving their child's life as the foremost consideration, placing considerations such as FP as secondary. Within this hierarchy of values, survival is an absolute prerequisite. Parents believe that meaningful discussions about long-term quality-of-life issues, including reproductive health, can only occur after securing effective treatment for their child's survival. A6: "Our primary concern is that she can be cured; everything else is secondary." A5: "In my view, I believe the current treatment is more important than all these other things."

Furthermore, parents express concerns that FP might consume time and deplete the child's energy, potentially compromising the effectiveness of the primary cancer treatment. Prioritizing life and treatment over FP, they often choose against the procedure. A15: "The paramount concern now is saving his life. We fear FP could impact his treatment and physical condition, so we haven't considered it. Saving his life takes precedence."

### 3.2.2 | Ensuring Safety and Efficacy

Children with leukemia face a higher risk of ovarian metastasis, prompting some parents to decline FP due to concerns that ovarian tissue transplantation may reintroduce cancerous cells. A11: "Because our child has leukemia, I worry that reintroducing the tissue might cause a recurrence."

Parents have reservations about FP methods involving invasive surgical interventions, primarily fearing that the procedure itself would inflict additional physical trauma and distress upon their child. They believe the child has already endured immense pressure from cancer treatment and are reluctant to subject him to further invasive procedures due to FP. A3: "Freezing the testicles requires surgery, and we don't want him to suffer any more harm." A9: "If it involves surgery, I think we'd rather not proceed."

Parents prioritize the efficacy of FP when making decisions. They recognize that FP does not guarantee successful conception in adulthood, particularly when FP is performed during treatment, which carries risks of impaired sperm or egg quality. Consequently, they are concerned about the effectiveness of FP. A6: "We also consider that even after FP, she might not necessarily conceive." A10: "Not knowing whether it's 100% effective or what the success probability is, I probably wouldn't opt for it." A2: "We're already halfway through the treatment cycle. Even if we freeze sperm now, it might not be viable."

### 3.2.3 | Shifting Reproductive Attitudes

Some parents place significant importance on childbearing, believing it is closely linked to the stability and wholeness of family structure. They point out that children are a pivotal factor in maintaining marital relationships and achieving family fulfillment; hence, they hope that their child will have biological offspring in the future. A7: "In truth, having children is profoundly important for everyone. Families without children are mostly either discordant or end in divorce." A14: "Having one's own children is vital; otherwise, there's always a sense of something missing. Only with children does a family feel complete."

Some parents view adoption as a feasible alternative, believing that even if their child faces fertility challenges in the future, they can still fulfill their parental desire to have children and build a complete family through adoption. A9: "If we really can't conceive, we can always adopt a baby." A3: "If we can't have children later, we can adopt."

Influenced by contemporary perspectives, younger parents no longer see marriage and childbearing as essential milestones in life. They believe personal lifestyles and family structures can be diverse, focusing primarily on their children's healthy development and emotional happiness. A5: "People like us from the 90s and the 00s generations aren't even getting married these days—how could we possibly think about having children?" A10: "When our child grows up, we won't necessarily push her into certain paths. As long as she's healthy, that's all that matters. Whether we have children or not, it doesn't really matter to me." A12: "Many young people today choose not to have children. Their generation simply has children if they want to and doesn't if they don't. I feel the same way about it. Having children isn't a big deal for us; it's not something we feel compelled to do."

## 3.3 | Decision Conflicts and Regret

This theme encompasses three subthemes: delayed information access, uncertainty regarding gonadal damage risks, and loss of children's reproductive rights. Parents of children with cancer often acknowledge the significance of FP only after their child has undergone treatment, leading to regret over failing to implement FP measures promptly. Concurrently, they face a dilemma during the decision-making process: navigating the uncertainty of risks while balancing their role as surrogate decision-makers and respecting the child's future reproductive autonomy.

### 3.3.1 | Delayed Information Access

Parents wish to access comprehensive and clear FP information as early as possible before treatment commences, allowing sufficient time for understanding and decision-making. A14: "We hoped to receive adequate information about FP before his treatment began, the sooner the better, so we could take the time to understand it."

Most parents failed to obtain FP information promptly upon their child's diagnosis and only fully acknowledged the pertinence of FP information after treatment commenced. By then, the optimal window for intervention had often passed, leading to feelings of regret. A1: "I feel we should have understood the impact of medication on fertility and the measures for FP before treatment began, allowing us to decide whether such preservation was necessary... Now that he's already on medication, pursuing FP might be pointless." A11: "I wanted to learn about FP when I first admitted her but couldn't find a reliable source for this information. Now she's lost that chance." A2: "It seems too late now. If only we'd considered this (sperm freezing) before treatment."

### 3.3.2 | Uncertainty Regarding Gonadal Damage Risks

While some parents recognize the potential fertility impact of cancer treatment, they regard it as a probabilistic and distant concern, leading them to adopt a watchful waiting approach. A4: "We'll be mindful of the treatment's impact on fertility, but we won't dwell on it too much. After all, it's a probabilistic event—not everyone will experience it." A8: "Even with chemotherapy, it's not 100% certain that her fertility will be affected. We'll only know once she starts menstruating and gets married."

Parents maintain relatively optimistic expectations regarding the potential fertility impact of treatment on their children, believing that it need not inevitably cause damage and hoping their child's fertility remains unaffected. A13: "Honestly, I tend to lean towards thinking positively. Things don't always unfold exactly as they're described in textbooks; sometimes luck plays a part. This treatment might not necessarily affect his fertility."

### 3.3.3 | Loss of Children's Reproductive Rights

Parents tended to adopt a passive, noninterventionist attitude toward their child's future fertility, demonstrating acceptance and tolerance even when there was a risk of fertility loss. A5: "Her desire to marry and have children is entirely her own affair... if she cannot have children, there is nothing we can do." A9: "At present, my son perceives having children as fulfilling my

wish. However, if he desires a family later, it should unfold naturally; it cannot be forced." A7: "Should she genuinely lose her fertility in the future, I wouldn't feel profoundly saddened. At least she'd be alive and well. There might be some regret... but I have not considered what she herself would think if she cannot have children."

Some parents also feel responsible for preserving their child's reproductive options while remaining acutely aware of the temporary nature of such decision-making. A11: "I hope to give my child one more choice when she grows up. Right now, she's still a child—whether she has children is entirely up to us adults, and that doesn't count as her choice. If she wants children later but we haven't frozen her eggs, we'll regret it when it's too late to reverse. Having one more option is always better."

## 4 | Discussion

Our study conducted in-depth interviews with parents of children with cancer to understand their genuine experiences and needs during the FP decision-making process. The study identified three themes: (1) lack of information before decision-making; (2) value preferences during decision-making; and (3) decision conflicts and regret. These findings indicate that FP decision-making is not a singular medical choice but rather an emotional and ethical journey commencing at the child's diagnosis and continuing to influence the affected family.

Parents of children with cancer require comprehensive and specialized FP information to support informed decision-making under significant stress. This study found that during the initial stages of diagnosis, parents' energies are primarily focused on cancer treatment, with widespread neglect of the treatment's impact on infertility risks. Some parents experienced decision regret due to delayed access to FP information. Research by Vialle et al. [33] revealed that adolescents and young adults with cancer lack attention prior to cancer treatment. Even when some parents recognize the importance of FP, the demands of treatment leave them little time to proactively seek relevant information. They strongly expect HP to initiate discussions on FP promptly, enabling them to understand related knowledge and options at an early stage. This allows sufficient time for decision-making and provides essential information support. This finding aligns with the research results of Greenzang et al. [10]. Research by Stein et al. [34] further indicates that patients tend to seek detailed information about fertility after diagnosis and before treatment commences. This may encourage integrated decision-making regarding both cancer treatment and FP, facilitating a more comprehensive approach. In this study, parents of children with cancer demonstrated misconceptions regarding FP, primarily manifesting in three aspects: firstly, underestimating the long-term effects of treatment to fertility; secondly, failing to recognize that fertility damage can occur during treatment itself; and thirdly, perceiving FP and cancer treatment as mutually exclusive options. These misconceptions led parents to actively avoid FP information, making them highly susceptible to missing the intervention window. This resulted in the irreversible loss of future fertility opportunities and may have triggered decision regret. The study further revealed that parents primarily obtained FP information from fellow patients and online platforms, lacking guidance from HP. This may correlate with the fact that healthcare staff rarely initiate FP discussions with families of pediatric patients [35]. The findings of this study suggest that HP should proactively provide timely FP education and information support to parents of children with cancer. This approach aims to correct misconceptions and alleviate information deficits during the decision-making process. Such measures may help mitigate the risk of decision regret arising from delayed or biased information, thereby enhancing family involvement and improving the quality of decisions made.

This study indicates that parents' decisions to forgo FP in pediatric cancer are multifactorial, with prioritizing life-saving treatment as the primary concern. All parents emphasized survival as paramount, and 60% (9/15) reported that potential long-term adverse effects were not considered at this stage. This is consistent with Ginsberg et al. [36], who found that 62.3% of parents were concerned that FP might delay cancer treatment. These findings suggest that, at diagnosis, treatment urgency dominates decision-making, while long-term quality-of-life considerations are deprioritized. This study identified three factors influencing parental decision-making: uncertainty regarding FP success rates, additional surgical risks associated with FP, and the experimental nature of FP techniques, consistent with previous studies [13]. Parents of children with leukemia further expressed heightened concerns about cancer recurrence, as reported by Alaoui et al. [11]. Although evidence suggests that approaches such as ovarian tissue cryopreservation may be relatively safe under specific conditions [37, 38], this evidence may not be effectively translated into clinical communication or adequately address parental concerns. These findings highlight the need for improved FP counseling. HP should not only present the risks and benefits of FP but also directly address concerns about treatment delay and recurrence, using up-to-date evidence. Acknowledging parents' prioritization of survival and providing individualized information may facilitate informed decision-making.

This study also found that parents holding differing views on reproduction demonstrate diverse attitudes and demands towards FP. Some parents emphasize the importance of biological ties within family structures, a perspective that leads to higher acceptance and demand for FP, viewing it as an essential avenue to safeguard their child's future reproductive aspirations. On the other hand, some parents accept adoption as an alternative to infertility. Younger parents often prioritize their child's quality of life and health status and do not view procreation as an inevitable life choice—this results in relatively lower demand for FP technologies among this group. A study from Hong Kong, China [17] indicates that a few parents acknowledged that under traditional Chinese cultural influences, their children, especially sons, have an important duty to continue the family lineage. However, survival and cure were still their highest priority. Diverse perspectives on childbearing indicate that parents consider not only medical factors but are also influenced by sociocultural contexts and personal values when making fertility planning decisions. Understanding this diversity enables HP to provide more personalized decision support, ensuring that parental choices align with their values.

In China, medical decision-making for minors is typically undertaken by parents, which may create potential conflicts with the child's future fertility intentions and values. Although

parents may express respect for their child's reproductive wishes, decisions to forgo FP are often made on the child's behalf due to their minor status and practical constraints, potentially depriving the child of reproductive autonomy in adulthood. Evidence suggests that children express a stronger desire for future fertility than their parents [39, 40]. Failure to provide FP for a child before treatment may lead to the child's regret regarding fertility outcomes in adulthood. Quinn et al. [41] emphasized differing priorities regarding fertility between pediatric cancer patients and their parents; parents prioritize treatment and survival, potentially delaying discussions about FP and overlooking children's concerns about gonadal damage risks. HP should act as facilitators of communication, clarifiers of information, and coordinators of shared decision-making. Guided by the principle of the child's best interests, they should support parental decision-making while respecting and safeguarding the child's future reproductive choices, thereby minimizing potential regret and conflict.

### 4.1 | Limitations

This study has several limitations that should be acknowledged. First, all participating families had ultimately decided not to pursue FP for their children. As a result, the findings primarily reflect the perspectives and experiences of parents who declined FP and may not fully capture the views of families who chose to undergo FP procedures. This may introduce a one-sided perspective and limit the comprehensiveness of the findings, as decision-making processes and considerations may differ between families who accept and those who decline FP. Future research should include families who have pursued FP in order to provide a more balanced and comprehensive understanding of parental decision-making in this context. Second, mothers, who typically assume the majority of caregiving responsibilities, comprised a higher proportion of participants (11 out of 15), which may limit the representation of fathers' perspectives and experiences. Nevertheless, all interviewed mothers reported that FP decisions were made jointly within the family, suggesting that maternal accounts can also reflect paternal viewpoints. Finally, the sample was drawn from a relatively homogeneous population; future studies should include families from diverse cultural backgrounds and broader geographic regions to enhance the representativeness and generalizability of the findings.

## 5 | Conclusions

This qualitative study, based on in-depth interviews with 15 parents of children with cancer, identified substantial informational gaps, value considerations, and emotional conflicts influencing FP decision-making. Parents frequently prioritized immediate life-saving treatment over FP, with some later experiencing decisional regret, underscoring the importance of early identification of parental decisional conflicts and the provision of tailored, value-congruent support. While the study is limited by its relatively homogeneous sample and the predominance of families who declined FP, the findings highlight critical unmet needs in this population. Future research should include families who have pursued FP, adopt longitudinal approaches to capture evolving decision experiences, and develop culturally adapted decision aids to strengthen counseling practices and enhance decision quality in pediatric oncology.

#### Author Contributions

Chengxuan Chen and Jiayu Huang were responsible for study conception and design, data transcription and analysis, and drafting of the manuscript, and contributed equally. Rongyi Chen contributed to data transcription and analysis. Meng Lv and Meng Huang contributed to study conception and design. Lisha Guo contributed to revisions of the manuscript. Yan Lin was responsible for supervision and critical revisions of the manuscript.

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#### Conflicts of Interest

The authors declare no conflicts of interest.

#### Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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