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## Research Paper

## Sitting on the fence: A qualitative study of perceptions regarding pelvic floor muscle training among pregnant women with urinary incontinence



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## ABSTRACT

**Objectives:** To explore the perceptions of pregnant women with urinary incontinence toward pelvic floor muscle training (PFMT).

**Methods:** Semi-structured personal interviews were used to collect data. Pregnant women with urinary incontinence and no contraindications to PFMT were recruited for semi-structured interviews in the Outpatient Department of Obstetrics in a Class A tertiary hospital in Shenzhen from October to November 2021. Purposive sampling was performed, and Braun & Clarke thematic analysis was used for the data analysis.

**Results:** Sixteen pregnant women with urinary incontinence and a mean age of  $(30.81 \pm 3.66)$  years participated in the interview. “Sitting on the fence” was the predominant theme acquired after analysis. Pregnant women had contradictory attitudes toward PFMT. A total of four themes and nine sub-themes have been extracted: “It is normal and does not really matter” (normalized urinary incontinence, insufficient attention to PFMT); “There is nothing I can do” (insufficient subjective motivations, limitation of objective conditions, lack of social support); “We have to take care of ourselves” (the increasing self-care awareness, emerging autonomous motivation to practice PFMT); “Training should be guaranteed” (requiring the guidance, suggestions, and surveillance of healthcare professionals; requiring the perceptive benefits).

**Conclusions:** This study reveals varying attitudes towards PFMT among pregnant women with urinary incontinence. To better promote pregnant women’s engagement in PFMT, it is necessary to provide professional guidance, increase self-care awareness, improve social support, and emphasize the benefits of PFMT.

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## What is known?

- Pregnancy and delivery are high-risk factors for urinary incontinence in women.
- Although urinary incontinence is not life-threatening, the discomfort, shyness, and self-abasement associated with urinary leakage could reduce or even deprive women of social activities, thus severely influencing their quality of life.
- Pelvic floor muscle training (PFMT) is the first-line treatment for urinary incontinence. However, previous evidences showed pregnant women had relatively poor adherence to PFMT.

## What is new?

- Our findings showed that the high prevalence and mild form of urinary incontinence during pregnancy led to urinary incontinence normalization and insufficient attention to PFMT in pregnant women.
- The practice of PFMT during pregnancy was hindered by insufficient subjective motivations, limitations related to objective conditions, and the lack of social support.
- Currently, pregnant women have contradictory attitudes toward PFMT. However, increased self-care awareness could improve the PFMT practice among pregnant women.
- Professional support from healthcare professionals and the perceived benefits of PFMT were prerequisites for pregnant women to engage in PFMT practice.

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## 1. Introduction

Urinary incontinence in women has become a widespread health issue, considering that pregnancy and birth are high-risk factors for it [1,2]. Consequently, the incidence of urinary incontinence is high during both pregnancy and postpartum. The incidence of urinary incontinence ranges from 21.3% to 40% at different stages of pregnancy depending on country or region [3–5], and approximately 26.5%–57.1% at different stages after birth [6–8]. Although urinary incontinence is not life-threatening, it can significantly influence social relationships and psychological health, thus having extensive negative effects on women's lives [9,10]. At the same time, Burgio et al. [11] found that the occurrence of urinary incontinence during pregnancy increased the risk of postpartum incontinence by 2–6 times. Urinary incontinence during pregnancy is highly associated with short- or long-term postpartum urinary incontinence [12–14]. With an increase in the number of deliveries, the risk of urinary incontinence also rises [15,16]. Urinary incontinence in pregnant women has become a substantial issue requiring urgent prevention and intervention.

According to the guidelines for the management of urinary incontinence in women issued by the National Institute for Health and Care Excellence (NICE) in 2019, supervised pelvic floor muscle training (PFMT) with a duration of at least three months was offered as first-line treatment for women with stress or mixed urinary incontinence [17]. The Cochrane systemic review further reported that structured PFMT in early pregnancy for continent women might prevent the onset of urinary incontinence during late pregnancy and postpartum [18]. PFMT involves the promotion of pelvic floor blood circulation and strengthening of pelvic floor muscles through repeated, voluntary contraction and relaxation of the pelvic floor muscles, mainly the levator ani muscle [19,20]. The International Consultations on Incontinence (ICI) recommends that the training is initially directed and supervised by a healthcare professional [21], and then, after the patients master the training method, they can do it at home by themselves [22].

Even though the effectiveness of PFMT in preventing and treating urinary incontinence has been widely acknowledged, a prospective cohort study in China showed that only 19.67% of pregnant women performed PFMT during pregnancy [23]. A study in Malaysia revealed that less than half of pregnant women had good PFMT practice (45.2%) [24]. The Thai research on knowledge, attitudes, and practice of PFMT among pregnant women even showed that 98.4% of pregnant women understood that PFMT could be performed during pregnancy and believed that PFMT would not affect pregnancy, yet only 10.7% of women engaged in unscheduled PFMT during pregnancy [25]. PFMT is still poorly practiced among pregnant women in China and other countries and is far from meeting effective urinary incontinence prevention and treatment requirements.

Indeed, the PFMT behaviors are intricate and are affected by many factors, including forgetfulness, tiredness, the lack of spare time, and confidence in correctly executing the training [26–29]. In their study on barriers and enablers of pelvic floor rehabilitation behaviors in pregnant women with stress urinary incontinence, Xu et al. [30] emphasized that the lack of knowledge and skills was an important barrier to pelvic floor rehabilitation behaviors. However, merely understanding the barriers and facilitators of behavior is hardly sufficient to promote the PFMT practice. Understanding the perceptions toward training among pregnant women is equally important. Qualitative methods are highly suitable to investigate the target audience's perceptions of interventions. Scholars across various fields have conducted qualitative studies to understand the perceptions of participants towards the intervention [31–33]. In the area of pelvic floor rehabilitative, Grant et al. [34] explored the

postpartum women's perceptions of postpartum PFMT through qualitative interviews. Regrettably, there is limited research available on the perceptions of PFMT during pregnancy, especially among pregnant women dealing with urinary incontinence. Therefore, this study aimed to explore the perceptions toward PFMT by interviewing pregnant women with urinary incontinence, supplement further and extend the findings of current studies and provide valuable insights for developing effective measures to improve the PFMT practice.

## 2. Methods

### 2.1. Study design

This qualitative exploratory study used face-to-face semi-structured interviews to explore pregnant women's perceptions with urinary incontinence toward PFMT. The exploratory qualitative approach is inductive and suitable for this under-researched topic [35].

### 2.2. Participants and settings

Purposive sampling was performed in the Outpatient Department of Obstetrics in a Class A tertiary hospital between October 2021 and November 2021, during which pregnant women  $\geq 18$  years old with urinary incontinence and no PTFM contraindications were recruited. The researcher (S. Liu) acted as the interviewer and was responsible for recruiting the study participants. Pregnant women admitted to the outpatient department were included, and those with contraindications to PFMT (such as placenta previa, threatened premature birth, and threatened abortion) were excluded by checking the cases of illness. Urinary incontinence symptoms were assessed by asking: "Did you experience involuntary urine leakage during abdominal pressure elevation, such as sneezing, coughing, laughing, and exercising during your pregnancy" [36]. The inquiry was stopped for the woman who answered "no," while for women who answered "yes," the study contents and objectives were briefly described, and these women were invited to participate in the interview; all of these women agreed to participate in the study. To thank the pregnant women for participating in the study, they were given baby nappies worth 100 CNY after they completed the interview. Pregnant women with different gestational weeks, ages, occupations, and birth histories (whether it is multipara) were interviewed using the principle of maximum variation sampling to ensure comprehensiveness and diversity of opinions. Information saturation was adopted as the principle of ending the sample collection.

### 2.3. Data collection

Relevant qualitative studies [29,34,37,38] were reviewed by two researchers (L. Chen and S. Liu), after which a primary semi-structured interview outline of five items was prepared. Next, the outline was further revised and refined through research group discussions to make the presentation more appropriate and understandable, and the redundant and leading item was removed to avoid repetition and bias: What are the difficulties for you to practice PFMT? Afterward, the researcher performed four pilot interviews (S. Liu); however, the data collected in the pilot interviews were not included in the formal analysis. The findings from the pilot interviews revealed that some pregnant women had only heard of PFMT but did not know the training-related specifics and were thus unable to provide rich opinions on this topic. Therefore, the outline was modified. Finally, the interview outline was as follows. 1) What is your experience with urine leakage? 2) What is

your opinion on PFMT? Do you know the benefits of PFMT? 3) Have you practiced PFMT since becoming pregnant? What are your reasons for practicing (or not practicing) PFMT? Pregnant women unfamiliar with the specifics of PFMT were introduced to the training program developed in our previous work [39]. Next, women were asked: 4) Would you like to practice PFMT in pregnancy, and why? What are your expectations from PFMT?

The researcher (S. Liu) informed the pregnant woman that the interview would be recorded in its entirety, and informed consent was obtained. After the prenatal examinations were completed, one-to-one semi-structured interviews with the pregnant women were performed by the researcher (S. Liu) in a spare room of the Outpatient Department of Obstetrics to prevent interference during the conversations and ensure the authenticity of the opinions, which lasted approximately 15–30 min and took an average of 26 min. This was the formal interview time in the standardized procedure. It is worth noting that the formal interview time did not include the introduction/closing time or the time needed to complete the questionnaire. During the interview process, the outline order was modified according to detailed conditions, and the unclear statements were checked with participants on time by retelling and clarifying to eliminate ambiguities. The non-vocal characteristics of pregnant women, such as facial expressions and movements, were also recorded. No repeat interviews were conducted with the participants. After the interview, the pregnant women were invited to complete a general information questionnaire, providing data such as age, height, body weight, and gestational age. Additionally, they were asked to self-assess their level of proficiency in the PFMT based on the researcher's instructions regarding the correct training.

The International Consultation on Incontinence Questionnaire-Urinary Incontinence-Short Form (ICIQ-UI-SF) was also completed to evaluate the severity of urinary incontinence, which was developed and authorized for use by the International Continence Committee [40]. The Chinese version of the ICIQ-UI-SF consists of 4 items: the frequency of urinary leakage (0–5 points), the amount of urinary leakage (0–6 points), the impact of urinary leakage on daily life (0–10 points), and the time of occurrence of urinary leakage (no points). The total score ranges from 0 to 21 points, where 0–7 points indicate mild symptoms, 8–13 points indicate moderate symptoms, and 14–21 points indicate severe symptoms [41]. The validity and reliability of this scale have been tested and confirmed in China.

#### 2.4. Data analysis

The Braun & Clarke thematic analysis [42] was performed. Coding of potential patterns from raw data was performed to decide the final theme, capturing the essence of data to answer the study question. The method included six phases, i.e., familiarizing with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. According to this method's theory, the individual experience could dominate the methods of reading data, which could be an important source of analysis [42]. After interviews were completed for a particular day, two researchers (L. Chen and S. Liu) transcribed the audio recordings verbatim, using "Yue Lu" 3.0 (the transcription software for this study), and the transcribed texts contained field notes from the interviews. No transcripts were sent back to the participants for correction. The NVivo 11 was used for the analysis of the transcribed texts. Two researchers (L. Chen and S. Liu) repeatedly read the transcribed texts, immersed themselves in the data, and became familiar with it, gaining a comprehensive

understanding. Subsequently, they independently performed data coding, after which the coding was discussed to reach a consensus. The theme was then searched and reviewed under the guidance of an expert in qualitative study, and the final theme was decided after three rounds of negotiations. All the researchers participated in defining and naming the theme. Finally, many grammatically wrong sentences were detected in the transcribed texts while producing reports. To help readers better understand the quotes, the word order of some quotes was modified. The reflections of researchers were embedded throughout the whole study process.

#### 2.5. Ethical considerations

This study was approved by the Ethics Committee of the Shenzhen Hospital of Southern Medical University (NYS-ZYYEC20210007). The data obtained in interviews were anonymized and safely kept to protect the privacy of study participants.

#### 2.6. Trustworthiness

To ensure the study's trustworthiness, several measures were implemented: first, the interviewer (S. Liu) was a master's degree candidate in midwifery who mastered the knowledge of pregnancy and delivery and could establish good relationships with pregnant women. Moreover, the non-nurse-patient relationship with pregnant women made women more at ease to talk openly and honestly about PFMT. Second, the one-to-one interviews with pregnant women were conducted in a spare room of the Outpatient Department of Obstetrics after the completion of prenatal examinations, thus preventing interferences during the conversations and ensuring the authenticity of the opinions. Third, two researchers (L. Chen and S. Liu) already completed a two-month long "thematic analysis training camp" organized by qualitative study experts before performing the data analysis and skillfully mastered Braun & Clarke thematic analysis processes and methods. In addition, an expert in qualitative study was invited to guide the theme searching and reviewing, and the final theme was decided after three rounds of negotiations. Finally, quotes from different interviewees were reported to ensure the trustworthiness of the findings.

### 3. Results

A total of 16 pregnant women were included in this study. The average age of the pregnant women interviewed was  $(30.81 \pm 3.66)$  years. Among the participants, 9 had a bachelor's degree or higher, 7 were primiparous, and 8 reported engaging in unscheduled PFMT during pregnancy. Other specific characteristics of the pregnant women interviewed are shown in Table 1.

"*Sitting on the fence*," i.e., contradictory attitudes to PFMT, were found among pregnant women, which was the final predominant theme in this study. On the one hand, women believed that urinary leakage was not a very serious issue in pregnancy, holding the attitude: "*It is normal and does not matter*." Protecting fetal health was the main priority in pregnancy, while other non-urgent matters could be addressed after birth. In addition, there were many difficulties in practicing PFMT, such as a tendency to forget to exercise, limited time, being unaware of pelvic floor healthcare, and lack of professional guidance. Women replied to insufficient conditions: "*There is nothing I can do*." On the other hand, the sense of values among pregnant women following the experience of birthing and advancement in society changed the pregnant women's worldview from focusing only on their family to

**Table 1**  
General characteristics of the pregnant women who participated in the interview.

No.	Age (years)	Pre-pregnancy BMI (kg/m <sup>2</sup> )	Current gestational week	Occupation	Education level	Multipara	Previous urinary incontinence	Practicing PFMT during pregnancy	Correctly mastering PFMT methods	ICIQ-UI-SF score
P1	34	22.5	34+	Express service	High school	Yes	No	No	No	3
P2	23	16.4	34+	Self-employed	Junior college	No	No	No	No	5
P3	35	19.1	32+	Financial industry	Master's degree	Yes	Yes	Yes	Unsure	6
P4	36	20.1	27+	Foreign trade industry	Junior college	Yes	Yes	No	No	6
P5	30	18.8	29+	Housewife	College	Yes	Yes	No	Unsure	8
P6	35	26.3	30+	Housewife	High school	Yes	Yes	No	No	11
P7	34	19.6	25+	Freelance	College	No	Yes	Yes	Unsure	3
P8	33	26.4	21+	Housewife	Junior college	No	No	Yes	Unsure	6
P9	31	20.8	40+	Employee	Master's degree	Yes	Yes	Yes	Unsure	6
P10	30	18.8	30+	Self-employed	College	Yes	No	No	Yes	4
P11	26	23.1	27+	Product manager	College	No	No	Yes	Unsure	5
P12	32	30.1	32+	Teacher	College	No	No	Yes	Yes	3
P13	29	24.5	30+	System testing engineer	Master's degree	No	No	Yes	Unsure	5
P14	28	19.1	34+	Teacher	College	No	No	Yes	Yes	3
P15	27	20.3	22+	Accountant	Junior college	Yes	Yes	No	Yes	13
P16	30	19.6	36+	Housewife	Junior college	Yes	Yes	No	Unsure	12

Note: BMI = body mass index. PFMT = pelvic floor muscle training. ICIQ-UI-SF = International Consultation on Incontinence Questionnaire-Urinary Incontinence-short form.

concentrating on themselves, reflected in the value “*We have to take care of ourselves.*” This indicated that pregnant women were taking better care of their health and paying more attention to their pelvic floor health. In addition, these women had certain requirements for healthcare service that could be summed up in the following statement: “*Training should be guaranteed.*” The pregnant women reported that they could accept PFMT, with the prerequisites of professional guiding and perceiving the benefits of training.

### 3.1. “It is normal and does not really matter”: normalized urinary incontinence during pregnancy and insufficient attention to PFMT

#### 3.1.1. Normalized urinary incontinence

More than half of pregnant women (10/16) believed that urine leakage during pregnancy was unavoidable and a common occurrence. “*It seems that everyone has it; you just cannot avoid it during pregnancy.*” (P10), and, “*I think it is normal to have some urine leakage during pregnancy.*” (P2), which were also opinions of people close to the pregnant women. “*I just think it normal ... either in the previous pregnancy or this one, everyone says it is normal, including people my parents' age or older. People around me also say it is normal to have urine leakage during pregnancy. My friends feel like this, and I feel the same way.*” (P16). Even some medical personnel told pregnant women that it was normal to have urine leakage during pregnancy. “*Yes, he or she (the doctor) told me it was normal,*” was reported by a pregnant woman (P1).

#### 3.1.2. Insufficient attention to PFMT

The normalization of urinary incontinence during pregnancy led to insufficient attention to PFMT. The pregnant women were informed of the possibility of urine leakage during pregnancy in advance, or they had already experienced it before, which prepared them for the issue of urine leakage. “*Everyone (pregnant women) said they had the urine leakage. Some mothers having a second baby*

*said the issue was more severe during the third trimester. Some could not even laugh and needed to be very careful when sneezing. It is a similar feeling to that of being inoculated with some vaccine.*” (P11). “*I have experienced it before, which makes it more acceptable now. Firstly, it is not very serious. Secondly, I had this experience before and was informed that it could happen again. I have read about it in news or other sources. Thus, it is not too bad if I approach it with a good attitude. Yes, I am mentally prepared it might happen again.*” (P12). Some women said that the frequency of urine leakage was not high and the symptoms were not severe, so this issue only had a minor effect on their lives, and thus, they did not pay too much attention to it. “*I am not greatly affected by it, as I experience just mild leakage. In addition, the frequency is not very high.*” (P13). “*I am not bothered by urine leakage, and as it does not occur during my daily activities, the disturbance is not very severe.*” (P7). Some women reported that although urine leakage was initially awkward and unpleasant, they accepted it and got used to it quickly. “*It was not very pleasurable initially; it made me unhappy and irritated. I frequently changed trousers and used pads, which could cause different conditions, such as inflammation. However, I have become used to it.*” (P6).

Some reported that compared with urine leakage during pregnancy, urine leakage after birth was more severe and required greater attention. “*Urine leakage could be more severe and more evident after birth. This issue is not so evident during pregnancy ... Many issues emerge after birth. For instance, the vagina becomes flaccid. Urine leakage can occur every day, making me think that the importance of urine leakage is not as severe during pregnancy as after birth.*” (P7). Some pregnant women believed pelvic floor rehabilitation after birth could cure the urine leakage; thus, they were not worried about urine leakage during pregnancy or doing PFMT. “*It is OK. I will still do the postnatal restoration; thus, I do not worry about the condition at the moment ... I believe that some equipment can help us do the postnatal restoration.*” (P10).

### 3.2. “There is nothing I can do”: the existence of subjective and objective difficulties in practicing PFMT during pregnancy

#### 3.2.1. Insufficient subjective motivations

The pregnant women reported that they had put all their focus on the fetuses and believed that ensuring the health of fetuses was the most important thing, while other issues could be addressed after birth. “I believe the most important thing is successfully getting through the pregnancy. If there are some issues, they could be dealt with after birth, at which time I will do whatever it takes. What I need to do in pregnancy is to protect the fetus’s health.” (P10). Pregnant women acknowledged the importance of training but did not consider it urgent. “... I know it is important, but deep down in my heart, I do not find it as urgent.” (P5). Half of the interviewed pregnant women did not practice PFMT, while the practice of the other half was also suboptimal. “I practiced very few times. Sometimes I think about it, but honestly, on very few occasions. Although the pregnancy lasted for a long time, I only practiced for maybe two or three times, and I did not care too much about it.” (P8). “I only did it now and then, but not very seriously ...” (P3). Pregnant women who did not practice PFMT worried that there could be risks associated with PFMT and were willing to practice PFMT only after birth. “If there is anything in this PFMT that could harm the fetus during pregnancy, I dare not try it as it is still not certain, truth to be told. I do not mean that I doubt the validity of PFMT, but I am not certain which movements could influence the baby. I want to start the practice after birth.” (P4).

#### 3.2.2. Limitation of objective conditions

Pregnant women reported that they had no in-depth knowledge of PFMT and were unsure or even unfamiliar with the correct training methods and contents or they could practice PFMT during pregnancy. “I have heard of it. However, regarding how to do it, I think it involves certain movements, which may require me to lie on the bed or floor. Anyway, I think it is all about specific movements. Also, I did not try to find out how to do it.” (P6). “Do you mean we can do this in pregnancy? Can I do it now?” (P15). Some women reported that they had to take care of their work and family, thus forgetting the training due to limited time and energy, and could not regularly go to the hospital to practice PFMT. “I may forget about it. As there are a lot of things on my mind, I may not be able to remember it” (P10). “I want to know how frequently should I practice? Do I have to come often? I mean, how many times do I have to come to the hospital? I need to find some spare time to fit in the training. Being in the second trimester, I still have to work before the maternity leave ...” (P9). “I live very far from (hospital) ... if I have to come to the hospital every day, it would be very inconvenient. I still have one more child living far from the hospital. I already feel fatigued being in the third trimester.” (P16). Four women reported they could not accept the invasive procedures associated with their private parts and were uncomfortable with medical personnel inserting their hands into their vagina to teach them the correct exercise. “I do not like the human intervention. Maybe I could accept the use of equipment, but human hand ... I feel resistant towards it and just plain awkward” (P2). “er, no, I am not willing to accept it, I do not feel comfortable with it.” (P1).

#### 3.2.3. Lack of social support

When asked whether they acquired pelvic floor healthcare suggestions from medical personnel in routine prenatal examinations, the women reported that doctors mainly did not care too much about it but only focused on fetal health. “However, this is not part of the prenatal examinations; the pelvic floor muscles are not examined. The obstetrician will not talk too much about it during pregnancy. I mean, he or she is not going to talk a lot about the health status of the pelvic floor in pregnancy; they only do examinations

included in prenatal examinations.” (P12). “Er, it seems that throughout the prenatal examinations, doctors have never talked about it at all. If doctors also discussed this, many issues would be solved.” (P9). Pregnant women could not obtain professional support from healthcare professionals and had only limited awareness of pelvic floor healthcare services provided by hospitals. “Er, I am not particularly familiar with the items provided by the hospital ... Especially regarding postnatal restoration, we may think of some small settings that could provide such a service. However, most pregnant women probably do not know that hospitals can provide this (pelvic floor healthcare).” (P11). People close to the pregnant women also lacked awareness of pelvic floor healthcare, thus unable to offer practical suggestions. “Most people around me do not do it (pelvic floor healthcare). They tend to let everything to nature and think it will recover by itself about half a year later, not requiring anything.” (P7). “They (other pregnant women around) do not take self-initiative to recommend such pelvic floor muscle treatment to you ...” (P11).

### 3.3. “We have to take care of ourselves”: the increase of self-care awareness and the emergence of autonomous motivation to practice PFMT

#### 3.3.1. The increasing self-care awareness

The previous negative experience of birth-giving caused physical and mental trauma to pregnant women. “Therefore, I am also thinking of the firstborn, when I was out of strength during the birth. I remember later, one doctor pressed my belly, and another used obstetric forceps to clamp the baby out.” (P4). “It is very painful when the pelvic floor muscles are flaccid. And they are really very flaccid after birth, and very painful.” (P15). If pregnant women had mothers with urinary incontinence, this prompted them to seek a positive treatment for urinary incontinence. “You have to know one thing: if you have this issue, doctors can cure it. You don’t want to be like my mother, who has had this for several decades. Thus, you have to see a doctor when it is still minor, right? This is not a very serious issue, is it?” (P15). The negative experience of birth-giving and societal advancement has led to a breakthrough in the sense of values in pregnant women, making them take better care of their health and shape. “My biggest preoccupation is to restore my body to how I was before pregnancy after the baby’s birth. Therefore, I am taking better care of myself in this aspect, caring more about me.” (P16). “I do not want any stretch marks. It is my body; thus, I exercise every day to prevent stretch marks ... I also have to control my weight, as I do not want to become too fat. It is tough to lose weight after childbirth.” (P14). The pregnant women did not want the pregnancy to influence their daily living, and returning to society as soon as possible after birth was a shared wish among these women. “For me, I don’t want the experience of childbirth to influence my life ... Er, I have my job. I wish I could recover as quickly as possible after childbirth, and then I can return to my work.” (P11). “You know, I am a full-time mother; thus, I do not want to be just a housewife after the birth of my second baby, and I want to return to society ...” (P16).

#### 3.3.2. Emerging autonomous motivation to practice PFMT

Pregnant women accepted pelvic floor healthcare prevention. “It (pelvic floor muscle) has a substantial role in our daily livings ... I just mean that if we are planning pregnancy, these muscles should be specifically strengthened.” (P11). “Generally, prevention is the first thing. Those like me who do not want stretch marks can do yoga for prevention, as I do. You should work on prevention because it could not be eliminated afterward.” (P14). Benefiting themselves was the motivation of pregnant women to practice PFMT, and promoting spontaneous birth was the greatest expectation of them. “The first purpose is to spontaneously deliver the baby, to be quick in the birth and suffer less. Second, exercise is also beneficial for my health, as it

could reduce the frequency of urine leakage in the future, and it is also better for the postnatal restoration.” (P14). “Doing PFMT is mainly for spontaneous birth; if the muscle group is strong, there is a lower possibility of tearing and lateral episiotomy, which is why I want to do the training.” (P13). “... I still think the Kegel exercise or pelvic floor muscle (training) is more significant in promoting spontaneous birth.” (P11).

### 3.4. “Training should be guaranteed”: professional support and perceptive benefits are prerequisites for training

#### 3.4.1. Requiring the guidance, suggestions, and surveillance of healthcare professionals

Pregnant women reported that the prerequisites for practicing PFMT were systemic protocol and professional advice. “I would like to do it if there is a protocol” (P2). “I think there must be someone who could guide us. After we have learned it, we can follow the videos and APP in our further practice.” (P3). Pregnant women wished to get suggestions from healthcare professionals on PFMT in pregnancy. “It would be better if doctors provided more suggestions. You know, we do not know it; if there are some issues, such as urine leakage in the third trimester, and they provide more suggestions on these issues, this could be helpful for the prevention of these issues. As patients, we do not know these things or at least do not know them well.” (P16). The women preferred to do the training at home while receiving remote instructions from medical personnel. “I don’t want to come to the hospital too often, as it is too far and will waste a lot of my time. I am OK with clocking in on the internet; yes, it would be more convenient, and you can do it at home.” (P8). Pregnant women reported that if PFMT were mandatory in prenatal examinations, it would gain better adherence. “I mean, it is not included in the prenatal examination. If it were included in the prenatal examination, everyone would practice it. I am telling you, really.” (P6).

#### 3.4.2. Requiring the perceptive benefits

The pregnant women appreciated the training effect and wished to receive a full-term pelvic floor muscle assessment to clarify the benefits. “I mean, before starting this session, you (the medical personnel) do a comprehensive evaluation of the muscle group to know the baseline conditions of the pregnant woman and then send her a report. Then, during the pregnancy, you let her train at home under your guidance. When she returns to the hospital for prenatal examinations, you also evaluate the pelvic floor muscles, and then the woman continues the training. Maybe after the spontaneous birth is completed, you can redo the evaluation and send her another complete report. She will then be clear whether this training could help her, and she will know her body better.” (P11). Pregnant women might be willing to attend the training after feeling the benefits. “For example, if I feel the urine leakage during a cough or laugh is reduced after the training, or it can be better controlled after it, I will stick to it.” (P9).

## 4. Discussion

This study explored pregnant women’s perceptions toward PFMT and finally acquired one predominant theme, i.e., “Sitting on the fence.” This predominant theme contained the following four aspects: “It is normal, and it doesn’t matter;” “There is nothing I can do;” “We have to take care of ourselves;” and “Training should be guaranteed;” indicating that the pregnant women had contradictory attitudes toward PFMT. Women believed urine leakage was normal, the symptoms were not severe, and many hindering factors prevented them from practicing PFMT; thus, they were unwilling to engage in training. However, previous experiences with childbirth, coupled with societal advancements, have heightened self-care

awareness among pregnant women. This has led them to prioritize their health and become more inclined to engage in activities that promote their well-being and physical fitness.

The high prevalence and non-seriousness of urinary incontinence in pregnancy made urinary incontinence a “normal” condition, undermining the importance of PFMT. A previous study conducted in the Netherlands showed that although urinary incontinence affected the quality of life in 90% of pregnant women, only 13.1% of them tried to seek help for urinary incontinence [43]. The most common reason for pregnant women not seeking help was that they thought urine leakage was an inevitable part of pregnancy and that there was nothing they could do about it [44]. The pregnant women who participated in the interview believed urine leakage was childbirth sequelae [45]. Such an idea of “normalcy” was generally from female relatives or close female friends who already had deliveries [46]. In the present study, some pregnant women even reported that during routine prenatal examinations, they were told by medical personnel that urine leakage was a regular occurrence in pregnancy. Consistent with our findings, a study from the Netherlands showed that pregnant women did not seek professional help for urinary incontinence because it did not substantially disturb their lives, or they believed that the symptoms could be spontaneously recovered [43]. In summary, due to their belief that urinary incontinence is normal, pregnant women were unaware of the importance of PFMT for preventing and treating urinary incontinence. Therefore, it is important to strengthen health education for pregnant women to help them better understand urinary incontinence and PFMT, which can be done through educational materials, training courses, and other means. This will enable them to understand urinary incontinence and PFMT, focus more on PFMT, and take active measures to prevent and treat urinary incontinence.

Even though PFMT in pregnancy has been recommended to prevent urinary incontinence [47], urinary incontinence was not a priority health issue for pregnant women in the present study, as an essential task for them was ensuring fetal health. In addition, some pregnant women worried about potential risks associated with the training, which prevented them from trying it; therefore, they preferred postnatal restoration. A cross-sectional study also found that approximately three-quarters of pregnant women were unaware of the preventive and therapeutic effects of PFMT. Concerns about the risk of miscarriage were the main reason for discontinuing the exercises during pregnancy [45]. Half of the pregnant women in this study (8/16) did not practice PFMT, which was consistent with the findings of a previous study [48], where only 11% of the 633 included pregnant women practiced PFMT, and more than 32% of pregnant women were not sure or did not approve of urinary incontinence treatment during pregnancy. Therefore, providing professional guidance for pregnant women that could help them understand PFMT and eliminate the concerns related to the safety of the training could be critical for improving the PFMT practice.

In addition to insufficient autonomous motivation, the limited objective conditions and lack of social support were also reasons explaining the poor practice of PFMT during pregnancy. The limited objective conditions for practicing the training were as follow. 1) The lack of PFMT-related knowledge among pregnant women, which made them uncertain or not knowing the correct training method or that PFMT could be done during pregnancy. A qualitative study by Grant et al. [34] also pointed out that pregnant women felt helpless about not knowing how to perform the correct PFMT contractions, which resulted in women not adhering to PFMT guidance. 2) Some pregnant women had to take care of both work and family, thus “forgetting,” “feeling too tired,” and “feeling too busy” to engage in PFMT, which was also consistent with the other

study [26]. In addition, some pregnant women could not accept the practice where the healthcare professionals insert their hands into the vagina to assess the correctness of training, which provided a challenge for the conventional assessment methods. The insufficient social support for practicing PFMT meant that healthcare professionals did not consider pelvic floor healthcare a priority in pregnancy, thus preventing pregnant women from acquiring PFMT-related suggestions during routine prenatal examinations. These findings agree with another study, which showed that the practices of urinary incontinence services in pregnancy provided by healthcare professionals were relatively poor [49]. Another study also showed that midwives did not consider PFMT in pregnancy as a priority and lacked confidence in guiding pelvic floor healthcare during pregnancy, which prevented them from effectively transducing the benefits and significance of PFMT [29]. Therefore, improving healthcare professionals' pelvic floor healthcare capability and designing appropriate training programs to help pregnant women integrate the training into work and daily living. In addition, encouraging researchers to explore more appropriate methods for evaluating the correctness of PFMT in pregnant women and helping them to overcome the difficulties in practicing the training are required to improve the training practice.

Negative birth-giving experiences and societal advancement led to the breakthrough of the sense of values among pregnant women, transforming the “sense of sacrifice” into a “self-caring sense.” The expectations in pregnancy were no longer limited to the fetus's health, as women in the present study wished that pregnancy would not influence their daily living and hoped to return to society quickly. Pregnant women paid more attention to their health and acknowledged the value of PFMT, thus making the autonomous motivation for practicing PFMT emerge. Previous studies have demonstrated that autonomous motivation is essential for engaging in certain behaviors, having important significance for individuals to practice and adhere to the training [50,51]. Therefore, we believe that with the improvement of pelvic floor healthcare services, the PFMT practice among pregnant women would be improved.

The pregnant women in this study had the demands of pelvic floor healthcare. They wished to gain more information about the pelvic floor healthcare service provided by the hospital and hoped that the hospital would provide them with health education on the pelvic floor, based on which they could acquire professional knowledge. These findings provide a new opportunity for healthcare professionals to actively discuss the issue of urine leakage with pregnant women during prenatal examinations and provide them with information on pelvic floor healthcare. A qualitative study by Xu et al. [30] also highlighted the need to enhance knowledge and skills in pelvic floor health care for pregnant women and use appropriate behavior change techniques (such as prompts) to provide a supportive environment. The effectiveness of PFMT depends on long-time persistence, and increasing adherence to training is essential [52]. The actual perceived effects of PFMT are what motivate pregnant women to adhere to exercise. Other studies have also shown that the perceived benefits of PFMT can increase training adherence [53]. Therefore, improving pelvic floor healthcare service, regular follow-up, and evaluation and quantification of the training effect could make pregnant women see the benefits, thus promoting adherence to training.

## 5. Limitations

The present study has two limitations. First, it was conducted in a first-line city in China, and the educational levels of the pregnant women interviewed were generally high, so the findings of this qualitative study could not be extrapolated to other pregnant

women with relatively poor opportunities for higher education. Second, the Braun & Clarke thematic analysis underlines the potential impact of individual researchers on the analysis findings, meaning that analysis conducted by researchers with different backgrounds and experiences may yield different themes [42]. Both data analysts in this study were unmarried women who were never pregnant, so it is impossible to rule out the possibility of different opinions from readers.

## 6. Conclusion

The present study provided rich opinions of pregnant women on urinary incontinence and PFMT, which could provide a valuable reference for improving the practice of PFMT. Our findings showed that pregnant women had contradictory attitudes to PFMT. Normalized urinary incontinence, insufficient attention to PFMT, and the subjective and objective difficulties in practicing training were the main reasons for the poor practice of PFMT in pregnant women. These negative perceptions were closely associated with the fact that pelvic floor healthcare in pregnancy was overlooked, and the service from healthcare authorities was absent. Correcting pregnant women's perceptions towards urinary incontinence, extending pelvic floor healthcare to pregnancy and even pre-pregnancy, and embedding PFMT into daily living are future directions for policymakers and medical authorities. The increasing self-care awareness in pregnant women is an opportunity and also a challenge. On the one hand, pregnant women reported demand for pelvic floor healthcare, which could bring new opportunities for pelvic floor healthcare services. On the other hand, providing professional, personalized services, quantifying the effects, and meeting the higher demands and expectancies of pregnant women to pelvic floor healthcare services are new challenges for healthcare professionals.

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## Data availability statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

## CRediT authorship contribution statement

**Ling Chen:** Conceptualization, Methodology, Data Curation, Writing – review & editing, Supervision, Project administration, Funding acquisition. **Sha Liu:** Methodology, Investigation, Data Curation, Writing – original draft, Writing – review & editing, Supervision. **Danli Zhang:** Writing – review & editing, Visualization, Supervision. **Wenzhi Cai:** Writing – review & editing, Supervision, Project administration, Funding acquisition.

## Declaration of competing interest

The authors have declared no conflict of interest.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijnss.2023.09.005>.

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