

Proactive pelvic floor health behaviors during pregnancy: A qualitative study based on the integrated theory of health behavior change

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Research Article

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Abstract

Background

Pelvic floor health management during pregnancy is essential for postpartum recovery, yet the factors shaping women's proactive engagement remain insufficiently understood.

Objective

To explore the cognitive, self-regulatory, and social determinants influencing pregnant women's proactive engagement in pelvic floor health behaviors.

Study design:

This was a theory-informed qualitative study. Twenty-one pregnant women were purposively sampled from a tertiary hospital in Shenzhen, China. Semi-structured interviews were conducted, and data were analyzed using a deductive framework based on the three core constructs of the Integrated Theory of Health Behavior Change (ITHBC). Inductive coding was used to identify emergent concepts beyond the framework. The study adhered to the COREQ guidelines to ensure methodological rigor and transparency.

Result

Engagement in pelvic floor health behaviors was shaped by interacting cognitive, behavioral, and social processes. Fragmented information led to partial understanding, low preventive awareness, and reduced self-efficacy. Difficulties in self-regulation—such as limited planning, inconsistent monitoring, and challenges in sustaining routines—impeded behavioral follow-through. Social support from family members, peers, and healthcare professionals was present but often unstable and context-dependent. Digital resources served as supplementary guidance, though their perceived credibility and usability determined their effectiveness. Beyond formal healthcare settings, women also acquired behavioral strategies through cultural and social pathways, including experiential learning, observation, and social media influence.

Conclusion

Proactive pelvic floor health behaviors arise from dynamic interactions among cognitive, behavioral, and social factors. Interventions should move beyond knowledge provision to empowerment-oriented, stratified strategies integrating credible digital tools, cultural sensitivity, and real-time feedback. These

findings extend the theoretical application of the ITHBC and inform personalized antenatal health promotion.

Trial registration:

not applicable.

Introduction

Pelvic floor dysfunction (PFD) is a common but often overlooked public health issue among women worldwide, mainly presenting as urinary incontinence (UI), pelvic organ prolapse, and sexual dysfunction [1, 2] Affecting 35%–38% of women—and up to 50% during perimenopause [3]—PFD not only causes physical and psychological distress but also increases healthcare costs [4]. In China, these burdens can negatively impact women's reproductive intentions, adding to the challenges of a declining birth rate.

Pregnancy is a critical period for PFD prevention. Pregnancy-related UI affects 31% of primiparous and 42% of multiparous women[5], and strongly predicts postpartum UI [6]. Because PFD symptoms can be delayed and may not appear until weeks or months after delivery [7–9], early preventive care during pregnancy is essential. Although pelvic floor muscle training (PFMT) is highly effective in preventing perinatal UI and severe perineal tears [10, 11], pregnant women often struggle to perform and maintain these exercises correctly in their daily lives [12–14].

With the development of the proactive health concept, individuals are increasingly encouraged to take responsibility for their own health through lifestyle and preventive measures [15–17]. Existing research has primarily focused on interventions and training outcomes, with limited understanding of how pregnant women perceive pelvic floor health, the behavioral barriers they encounter when performing PFMT, and the factors influencing their willingness and adherence.

In this context, this study, guided by the Integrated Theory of Health Behavior Change (ITHBC) [18, 19], aims to explore the key factors influencing proactive pelvic floor health behaviors among pregnant women in China. Using deductive content analysis combined with thematic extraction and frequency analysis, the study seeks to provide empirical support for theory development and offer evidence-based recommendations for optimizing prenatal pelvic floor health interventions, reducing the risk of PFD, improving women's health outcomes, and supporting national reproductive policies.

Methods

Study design

We conducted a descriptive qualitative study using face-to-face interviews, with data analyzed through the ITHBC framework. Both deductive and inductive content analyses were employed. Following the

ITHBC, a deductive approach was used to categorize and calculate the frequencies of data fitting the theoretical constructs [20]. For data that could not be directly mapped onto the ITHBC framework, an inductive approach was applied to identify underlying patterns and emergent themes. The study rigorously adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines [21] (**Appendix 1**).

Theoretical framework

Developed by American nursing scholar Ryan, the ITHBC synthesizes multiple widely used health behavior theories into a mid-range theoretical framework [18]. It posits that behavior change results from the synergistic interaction of three key dimensions: knowledge and beliefs (understanding health issues and evaluating personal capabilities), self-regulation skills (goal setting, self-monitoring, problem-solving, and action planning), and social facilitation (external resources such as social support, community services, and technological tools). The ITHBC has demonstrated robust empirical utility in guiding complex health behaviors, including chronic disease self-management [22], dietary management [23], exercise interventions [24], and postpartum weight control [25]. Given that prenatal pelvic floor health requires continuous self-management and contextual adaptability, ITHBC serves as an highly appropriate conceptual foundation for this study to systematically investigate the mechanisms driving pregnant women's proactive health behaviors. The interview guide for this study was also designed based on this theoretical framework, and its specific content is presented in **Appendix 2**.

Study setting and recruitment

Using maximum variation purposive sampling, we recruited pregnant women from the obstetrics outpatient clinic and inpatient wards of a tertiary general hospital in Shenzhen, China. To ensure sample diversity, participants were purposefully selected to reflect variations in educational background, geographic distribution, and income levels.

Inclusion criteria were: (a) age ≥ 18 years; (b) gestational age ≥ 24 weeks; (c) ultrasound-confirmed singleton pregnancy; and (d) voluntary participation with written informed consent. Exclusion criteria were: (a) psychiatric disorders or cognitive impairments; (b) severe medical or surgical conditions; and (c) significant high-risk pregnancy factors (e.g., congenital heart disease, hypertensive disorders, threatened preterm labor, or recurrent miscarriage) that contraindicate prenatal pelvic floor muscle exercises.

Data collection

Between June and July 2025, data were collected through face-to-face, semi-structured interviews. After drafting the initial interview guide based on the ITHBC, we pilot-tested it with three pregnant women and finalized the instrument based on their feedback. Key questions included: "When did you first become

aware of pelvic floor health management?” “Through what experience did you begin to pay attention to it?” “Did you receive any support from family or friends?” and “What challenges or barriers have you encountered?” Formal interviews were conducted by the first author in a private, quiet hospital setting. A total of 21 participants were formally interviewed (mean duration: 17.27 ± 4.95 minutes). All sessions were audio-recorded, anonymized, and transcribed verbatim within 48 hours. Data saturation was considered achieved when no new codes or concepts emerged and recurrent themes were consistently identified.

Data analysis

The deductive approach aimed to test the applicability of the ITHBC. The research team first identified key concepts based on the theory and developed an initial set of coding categories to explore the relationships between codes and compare their ordering through frequency analysis [26]. Inductive content analysis addressed components not sufficiently explained by the ITHBC, allowing novel insights to emerge [27]. A total of 24 pregnant women were recruited, among whom 3 participated in pilot interviews to refine the analytical procedures. Formal analysis was conducted on data from 21 participants. A directed content analysis method was used, comprising three main steps:

Step 1: The researchers repeatedly read the transcripts to gain familiarity and identify analytically meaningful units of text. Initial coding was conducted using NVivo 14.0 software. To ensure coding stability, intra-coder reliability was assessed using Holsti's percentage agreement method.

Step 2: A structured analytical matrix was constructed based on the ITHBC framework. Two coders who had received 8 hours of specialized training conducted the formal coding. The training covered: (a) an in-depth understanding of the ITHBC and the conceptual meanings of each category in the matrix, and (b) practice coding using pilot data, followed by group discussion to enhance category clarity and alignment.

Step 3: The formal analysis proceeded in three phases: (a) thorough review of the transcripts to contextualize the data, (b) categorization of meaning units within the theoretical matrix and calculation of code frequencies, and (c) synthesis of high-frequency categories into overarching themes. For data that could not be mapped onto the theoretical framework, inductive content analysis was used to group codes by similarity, extract higher-order categories, and develop emergent themes.

To ensure inter-coder reliability, both Holsti's agreement index and Cohen's kappa coefficient were calculated to assess consistency between coders.

Rigor and reflexivity

To ensure the rigor and credibility of the research process, inter-coder reliability between the trained coders was evaluated using Cohen's kappa coefficient. The first author strictly adhered to ethical guidelines, employed a consistent interview approach, and maintained a reflexive journal throughout the

study to document subjective judgments and potential biases [28], thereby enhancing transparency and the overall validity of the research.

Results

A total of 21 participants were formally interviewed in this study. The mean age was 30.86 ± 3.09 years, and the average gestational age was 31.05 ± 4.96 weeks. Detailed demographic characteristics are presented in Table 1.

Table 1
Characteristics of participants.

Characteristic	Number	Characteristic	Number	Characteristic	Number
Age		BMI		Employment status	
24–30	9	18.5–25	8	Yes	16
30–40	12	≥ 25	13	No	5
Gravidity		Education level		Monthly income	
Primigravida	16	Associate degree	6	<5000 RMB	2
Multigravida	5	Bachelor’s degree	14	5000–10000 RMB	3
Gestational weeks		Postgraduate degree	1	10000–20000 RMB	12
24–30 weeks	11			>20000 RMB	4
30–38 weeks	10				

Intra- and inter-coder reliability

To assess coding stability, coder BY re-coded 20% of the transcripts (n = 4) two weeks after the initial coding, achieving an intra-coder agreement of 0.90 (Holsti’s method). Coders LS and LD independently coded the same 20% sample. The inter-coder reliability, assessed via Cohen’s kappa, was 0.73 (95% CI: 0.59–0.87), demonstrating substantial agreement and rigorous coding stability.

Categories and frequency of beliefs

Guided by the ITHBC, deductive and inductive content analyses were used to categorize the interview data. Initial codes were refined via semantic induction (e.g., conceptualizing “I’m too lazy to move” as “lack of motivation”). Frequency analysis and semantic synthesis revealed three interrelated themes shaping proactive health behaviors. The detailed coding categories and their frequencies are summarized in Table 2.

Table 2

Coding Results of Influencing Factors for Proactive Health Behaviors under the ITHBC Framework

Knowledge & Beliefs	n/N	%	Self-Regulation Skill and Ability	n/N	%
Lack of pelvic floor knowledge	18/21	85.71	Pre-pregnancy exercise habits	10/21	47.62
Attention to pelvic floor health	21/21	100.00	No planning	13/21	61.90
Only know about postpartum	14/21	66.67	Regular exercise	8/21	38.10
Understand later	12/21	57.14	Continuation of pre-pregnancy habits into pregnancy	4/10	40.00
Lack of motivation	14/21	66.67	Supervised by doctor and self	11/21	52.39
Implicit learning	7/8	87.5	Only self-supervised	19/21	90.48
			Time issues	14/21	66.67
Social Facilitation	n/N	%	Physical strength issues	14/21	66.67
Friends, family, etc.	17/21	80.95	Positive immediate feedback	4/21	19.05
Healthcare professionals	13/21	61.90	Negative immediate feedback	1/21	4.762
Multimedia platforms	19/21	90.48	Positive feedback leading to regular exercise	2/4	50

Theme 1: Coexistence of Cognitive Deficits and Low Self-Efficacy—Core Barriers to Behavioral Initiation

Participants demonstrated a delayed and fragmented understanding of pelvic floor health. Specifically, 85.7% (18/21) were unaware of specific pelvic floor muscle functions or related exercise mechanisms. While some recognized terms like "Kegel exercises" or "postpartum rehabilitation," their knowledge remained unsystematic, with most having only recently been exposed to these concepts.

I have no foundation and don't know how to exert the right force. I'm also afraid to try it on my own. (P010)

I always thought pelvic floor exercises were something for after childbirth. (P013)

I know this is important, but neither the doctor nor my family has told me how to do it properly. (P002)

Among the participants, 38.1% (8/21) engaged in regular exercise during pregnancy. However, 87.5% (7/8) of these women were motivated by alternative goals, such as weight or glucose control, rather than an explicit awareness of pelvic floor health. Consequently, they inadvertently performed exercises that objectively benefited their pelvic floor function without conscious intent.

The doctor advised me to control my weight, so I followed exercise videos. (P009)

During pregnancy, many exercises are done for shaping or to have an easier birth, but pelvic floor health is rarely considered. (P010)

Although most participants recognized the general benefits of pelvic floor exercises, their awareness regarding the urgency of prenatal intervention remained low. Specifically, 66.7% (14/21) of the women only paid attention to pelvic floor health after experiencing symptoms or during the postpartum period.

The doctor didn't say it was something I had to do, and since I felt fine, I didn't do it. (P002)

Furthermore, 66.7% (14/21) reported low self-efficacy regarding sustained exercise, primarily attributing this to physical discomfort, a lack of progress feedback, and diminished confidence.

I've felt very fatigued since becoming pregnant and just don't feel like moving much. (P011)

I feel physically weak—training itself is difficult and quite exhausting. (P015)

I experienced bleeding during pregnancy, so I became worried and didn't dare to exercise.” (P007)

A total of 40.00% (4/10) of pregnant women demonstrated a high level of proactiveness, which was often associated with established pre-pregnancy exercise habits or clear expectations for postpartum physical recovery.

I hope to maintain the same physical condition before and after childbirth. (P015)

Theme 2: Social Facilitation and External Environment — Diverse Supports but Structural Deficiencies

Participants accessed pelvic floor health information through multiple channels, including new media platforms (90.48%, 19/21), family and friends (80.95%, 17/21), and healthcare professionals (61.91%, 13/21), yet only 38.10% (8/21) maintained regular exercise.

My family didn't really understand these things. (P020)

A friend who already had her baby explained things and recommended Pilates. (P015)

The doctor only recommended one exercise to me—something like the butterfly stretch. (P019)

Some participants actively sought supplemental resources via online communities or close interpersonal networks. Platforms like Xiaohongshu and Douyin (the Chinese version of TikTok) emerged as primary information sources; however, participants commonly reported concerns regarding the credibility and accuracy of this content.

I first heard about pelvic floor exercises through an expert's short video. (P021)

I searched for pregnancy-related terms, and then the platform kept recommending similar content. I ended up watching a few videos and followed the influencers' workouts. (P012)

Online information is inconsistent, and it's hard to tell what's true. (P002)

Most participants reported only recent exposure to the concept of postpartum rehabilitation. Access to professional resources was limited by barriers such as high costs, geographic inaccessibility, unclear service provision, and a lack of outcome evaluation, which collectively hindered continuous professional guidance.

Visiting the hospital is too troublesome, and the procedures are quite complicated. The external institutions are not professional, so I'd rather just take a walk by myself. (P018)

Theme 3: Self-Regulation and Behavioral Strategies — Coexistence of Planning Deficits and Flexible Execution

Exercise during pregnancy lacked systematic planning, manifesting as fragmented and sporadic behaviors. A majority (61.91%, 13/21) did not establish clear exercise plans, and 66.67% (14/21) faced interruptions due to time constraints and daily responsibilities, making adherence difficult.

Sometimes I just do it when I remember, but without a fixed plan, I can't keep it up. (P017)

I get off work late, then have to study at home—there's no time for exercise. (P021)

I have another child to take care of at home, so there's simply no time. (P006)

In addition, some pregnant women expressed concerns about the safety of engaging in physical exercise, particularly when experiencing physical discomfort or abnormal symptoms.

I read online that some pregnant women experienced bleeding after exercising improperly at home, so I'm too afraid to try. (P007)

Only 38.10% (8/21) of pregnant women maintained regular exercise during pregnancy. Although 47.62% (10/21) reported having pre-pregnancy exercise habits, 40.00% (4/10) of them did not actively adjust their behavioural routines during pregnancy.

I had exercise habits before pregnancy and during pregnancy I sought suitable exercises to continue. (P013)

Positive feedback from exercise, such as physical relaxation and improved mood, was reported by 19.0% (4/21) of the participants. However, only 50.0% (2/4) of these women translated this positive experience into sustained motivation, with one participant discontinuing exercise entirely due to perceived difficulty.

I feel much more relaxed after exercising. (P013)

If I persist twice without seeing results, I won't continue even if others suggest it. (P015)

A total of 57.1% (12/21) of the participants tended to postpone exercise until the postpartum period, demonstrating a generally low motivation for physical activity during pregnancy.

If physical symptoms really appear, then I would definitely start pelvic floor training. (P019)

Right now, my energy isn't focused on pelvic floor health; I'm probably paying more attention to other issues and will look into it after childbirth. (P015)

Behavioral monitoring primarily relied on subjective sensations and medical advice. Specifically, 90.5% (19/21) of the participants depended on self-assessment to evaluate their exercise outcomes, while 52.4% (11/21) reported that physician recommendations influenced their behavioral choices.

I prioritize my own perception of bodily changes. (P019)

If the doctor advises me to do something, I will follow it. (P001)

Discussion

Principal Findings

This qualitative study, grounded in the ITHBC, explored the complex perceptions and experiential processes underlying pregnant women's proactive engagement in pelvic floor health behaviors. We identified a multi-layered behavioral phenomenon shaped by the dynamic interplay of cognitive, self-regulatory, and social processes. Specifically, the findings reveal that while delayed knowledge, low self-efficacy, and fragmented social support act as prominent perceived barriers to behavioral initiation and maintenance, positive experiential reinforcement and unique cultural/social pathways (such as implicit learning) serve as key contextual drivers that activate proactive health behaviors.

Results

Our findings align with previous research. At the level of health knowledge and beliefs, prior studies have shown that although most pregnant women in China recognize the importance of pelvic floor exercises, their understanding of pelvic floor muscle function, the risk of dysfunction, and proper exercise techniques is often limited and fragmented, which constrains the development of preventive awareness and the initiation of early intervention behaviors[29–31]. Traditional cultural beliefs, such as “mild symptoms do not require attention” or “rest should take priority during pregnancy,” may further weaken risk perception and delay the initiation of health behaviors[32]. This contrasts with findings from Western populations, where higher perceived susceptibility and well-established risk communication mechanisms are typically associated with more proactive health behaviors[33], highlighting the critical influence of cultural context and health education systems on behavior formation.

Regarding social facilitation, while family support and professional guidance play important roles, their actual effectiveness is often limited[30, 34]. Our findings suggest that limitations in domestic digital platforms, including heterogeneous information quality, insufficient personalization, and discontinuous support services, may undermine the long-term maintenance of health behaviors[35, 36]. Meanwhile, offline professional rehabilitation resources are constrained by time, geographic, and cost factors[37], leaving many pregnant women in a state of “information overload but insufficient guidance.” Consequently, social facilitation of pelvic floor health behaviors during pregnancy is characterized by participation from multiple actors but uneven support effectiveness, with inadequate coordination between digital platforms and offline resources representing a key bottleneck to fully realizing social facilitation.

In terms of self-regulation, previous studies consistently emphasize the importance of clear goal-setting, detailed planning, and timely feedback for sustaining health behaviors [38, 39]. Consistent with the literature, participants in this study, although motivated to engage in pelvic floor exercises, generally lacked clear goal-setting, feasible action plans, and systematic feedback mechanisms, resulting in an unstable “initiation–interruption–stagnation” behavioral pattern. Short-term positive experiences, such as symptom relief or improved sleep quality, served as important drivers for behavioral continuation, whereas physical discomfort, emotional fluctuations, concerns for fetal safety, and work-related stress frequently led to interruptions. Thus, unclear goals, absent action pathways, and insufficient feedback constitute key challenges to self-regulation of pelvic floor health behaviors during pregnancy, with the balance between short-term positive reinforcement and multiple external disruptions determining the stability of behavior maintenance.

Clinical Implications

This study systematically examined how cognitive structures, social facilitation, and self-regulation influence pregnant women’s proactive engagement in pelvic floor health behaviors. At the intervention level, a stratified and flexible approach is recommended. Structured health education should be

integrated into routine antenatal care and combined with practical skills training to promote the actual implementation of health behaviors. Low-threshold, high-feedback interventions—such as phased goal setting, progress visualization, and immediate experiential reinforcement—can facilitate early engagement and sustain behavioral motivation. Meanwhile, in resource-limited settings, digital tools guided by healthcare professionals (e.g., pregnancy health apps) can support continuous behavior monitoring and guidance. For pregnant women with limited cognitive or attentional resources, interventions emphasizing contextual cues, experiential learning, and emotional reinforcement may be particularly effective.

At the service system level, the findings highlight three priority areas for improvement aligned with the core domains of the ITHBC. First, within the cognitive domain, health education should shift from unidirectional information delivery to the co-construction of meaning, thereby strengthening pregnant women's intrinsic motivation and health-related beliefs. Second, from a self-regulatory perspective, goal setting and action planning should be embedded within everyday life contexts to lower barriers to behavior enactment and support sustained self-management. Third, in terms of social facilitation, it is essential to establish a coordinated support system that integrates healthcare institutions, families, and community resources, fostering an environment conducive to long-term behavior maintenance and enabling pregnant women to transition from passive recipients of care to active managers of their pelvic floor health.

Research Implications

Methodologically, the fluid and context-dependent nature of prenatal health behaviors uncovered in this study highlights the limitations of static, cross-sectional assessments. These findings imply a critical need for the field to transition toward longitudinal and ecologically valid methodologies. Specifically, future research would benefit from operationalizing qualitative themes into dynamic measurement tools, such as Ecological Momentary Assessment (EMA) via mobile health platforms, to capture real-world behavioral fluctuations. Conceptually, by illuminating the day-to-day variations in cognitive and self-regulatory factors, this study underscores the necessity of moving beyond conventional, one-size-fits-all antenatal education. Instead, it points to the conceptualization and evaluation of personalized, just-in-time adaptive interventions that can deliver tailored, support within pregnant women's natural environments.

Strengths and Limitations

In terms of theoretical application, a primary strength of this study lies in its application of the ITHBC framework to systematically explore the subjective experiences of prenatal proactive pelvic floor health, moving beyond conventional quantitative outcome evaluations. Additionally, the study strictly adhered to the COREQ guidelines and utilized maximum variation purposive sampling, ensuring sample diversity and the depth of qualitative data.

However, certain limitations should be noted. Because participants were recruited from a single tertiary hospital in an economically developed urban region, the sample had relatively high educational and income levels, which may restrict the transferability of the findings to rural or resource-constrained settings. Furthermore, the lack of a structured comparative analysis between primiparous and multiparous cohorts limits deeper insights into parity-driven behavioral differences. Finally, since the data were collected through retrospective face-to-face interviews, the findings may be subject to recall bias and social desirability bias when participants recounted their pelvic floor exercise experiences.

Conclusion

This study demonstrates that pregnant women's proactive pelvic floor health behaviors are not merely determined by isolated cognitive decisions, but rather emerge from dynamic interactions among cognitive efficacy, self-regulatory capacity, and social facilitation. While social support deficits and fragmented self-regulation present barriers to behavioral adherence, positive experiential feedback and daily implicit learning act as key driving forces for behavioral activation. These findings validate and expand the application of the ITHBC framework in perinatal care, providing a locally grounded empirical foundation to design empowerment-oriented clinical interventions that safeguard long-term maternal well-being.

Declarations

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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CRediT authorship contribution statement

Yu Bao: data curation, writing – original draft preparation, writing – review and editing, formal analysis. **Si Lu:** investigation, data curation. **Dan Luo:** conceptualization, methodological design. **Wei Ren:** resources. **Ling Chen:** conceptualization, resource, supervision, writing – review and editing. **Wenzhi Cai:** supervision, funding acquisition; resources.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical approval Statement

This study was approved by the Ethics Committee of Shenzhen Hospital, Southern Medical University (**Approval No. NYSZYEC2024K071R001**). All participants provided written informed consent prior to participation after being fully informed about the study's purpose and procedures. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Participants' confidentiality and privacy were strictly protected throughout the research process. Participants were informed of their right to withdraw from the study at any time without any consequences. All data collected are stored securely and will be retained for a minimum of five years solely for academic research purposes.

References

1. Corton MM: **Anatomy of pelvic floor dysfunction**. *Obstet Gynecol Clin North Am* 2009, **36**(3):401-419.
2. Memon HU, Handa VL: **Vaginal childbirth and pelvic floor disorders**. *Womens Health (Lond)* 2013, **9**(3):265-277; quiz 276-267.
3. Gonzalez-Timoneda A, Valles-Murcia N, Munoz Esteban P, Torres Lopez MS, Turrion Martinez E, Errandonea Garcia P, Serrano Raya L, Nohales Alfonso F: **Prevalence and impact of pelvic floor dysfunctions on quality of life in women 5-10 years after their first vaginal or caesarian delivery**. *Heliyon* 2025, **11**(3):e42018.
4. Slieker-ten Hove MC, Pool-Goudzwaard AL, Eijkemans MJ, Steegers-Theunissen RP, Burger CW, Vierhout ME: **Prevalence of double incontinence, risks and influence on quality of life in a general female population**. *Neurourol Urodyn* 2010, **29**(4):545-550.
5. Zhang D, Bo K, Montejo R, Sánchez-Polán M, Silva-José C, Palacio M, Barakat R: **Influence of pelvic floor muscle training alone or as part of a general physical activity program during pregnancy on urinary incontinence, episiotomy and third- or fourth-degree perineal tear: Systematic review and meta-analysis of randomized clinical trials**. *Acta Obstet Gynecol Scand* 2024, **103**(6):1015-1027.
6. Milsom I, Gyhagen M: **The prevalence of urinary incontinence**. *Climacteric* 2019, **22**(3):217-222.
7. Gyhagen M, Bullarbo M, Nielsen TF, Milsom I: **The prevalence of urinary incontinence 20 years after childbirth: a national cohort study in singleton primiparae after vaginal or caesarean delivery**. *BJOG* 2013, **120**(2):144-151.
8. Ng K, Cheung RYK, Lee LL, Chung TKH, Chan SSC: **An observational follow-up study on pelvic floor disorders to 3-5 years after delivery**. *Int Urogynecol J* 2017, **28**(9):1393-1399.

9. Vogel JP, Jung J, Lavin T, Simpson G, Kluwgant D, Abalos E, Diaz V, Downe S, Filippi V, Gallos I et al: **Neglected medium-term and long-term consequences of labour and childbirth: a systematic analysis of the burden, recommended practices, and a way forward.** *Lancet Glob Health* 2024, **12**(2):e317-e330.
10. Kahyaoglu Sut H, Balkanli Kaplan P: **Effect of pelvic floor muscle exercise on pelvic floor muscle activity and voiding functions during pregnancy and the postpartum period.** *Neurourol Urodyn* 2016, **35**(3):417-422.
11. Szumilewicz A, Kuchta A, Kranich M, Dornowski M, Jastrzebski Z: **Prenatal high-low impact exercise program supported by pelvic floor muscle education and training decreases the life impact of postnatal urinary incontinence: A quasiexperimental trial.** *Medicine (Baltimore)* 2020, **99**(6):e18874.
12. Eneanya ND, Winter M, Cabral H, Waite K, Henault L, Bickmore T, Hanchate A, Wolf M, Paasche-Orlow MK: **Health Literacy and Education as Mediators of Racial Disparities in Patient Activation Within an Elderly Patient Cohort.** *J Health Care Poor Underserved* 2016, **27**(3):1427-1440.
13. Tang L, Wang J: **Exploring the Relationship between Health Information Literacy and Health Behaviors of the Elderly.** *Iran J Public Health* 2023, **52**(7):1439-1446.
14. He J, Wang T: **The community proactive health management model based on the grounded theory: The case of Beijing, China.** *Heliyon* 2023, **9**(4):e14992.
15. Tang K, Yao J, Wang R, Ruan W, Chen X, Yang L, Li Y, Zhang R, Zhou C: **Factors influencing proactive health behaviors in pre-frailty older adults: A qualitative study based on theory of planned behavior.** *Geriatr Nurs* 2024, **60**:671-676.
16. Lu Z, Yu L, Fan K, Hu T, Liu L, Li S, Zhou Y: **Associations between social support and proactive health behaviours among Chinese adolescents: the mediating role of self-efficacy and peer relationships.** *BMC Public Health* 2024, **24**(1):2548.
17. Zhang Y, Li J, Hu Y, Liang S, Wang Y, Chen L, Cai W, Ren W: **Proactive health behavior in middle-aged and older adult females with urinary incontinence: A grounded theory study.** *Neurourol Urodyn* 2024, **43**(8):2005-2016.
18. Ryan P: **Integrated Theory of Health Behavior Change: background and intervention development.** *Clin Nurse Spec* 2009, **23**(3):161-170; quiz 171-162.
19. Schneider S, Junghaenel DU, Smyth JM, Fred Wen CK, Stone AA: **Just-in-time adaptive ecological momentary assessment (JITA-EMA).** *Behav Res Methods* 2024, **56**(2):765-783.
20. Elo S, Kyngas H: **The qualitative content analysis process.** *J Adv Nurs* 2008, **62**(1):107-115.

21. Tong A, Sainsbury P, Craig J: **Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups.** *Int J Qual Health Care* 2007, **19**(6):349-357.
22. Wu P, Liao L: **A Theory-Based Nursing Intervention to Improve Self-Management Behavior and Health Status in Older Adults With Type 2 Diabetes and Frailty.** *Res Gerontol Nurs* 2024, **17**(6):293-306.
23. Chaudhry BM, Siek KA, Connelly K: **The Usability and Feasibility of a Dietary Intake Self-Monitoring Application in a Population with Varying Literacy Levels.** *J Pers Med* 2024, **14**(9).
24. Heinrich KM, Carlisle T, Kehler A, Cosgrove SJ: **Mapping Coaches' Views of Participation in CrossFit to the Integrated Theory of Health Behavior Change and Sense of Community.** *Fam Community Health* 2017, **40**(1):24-27.
25. Ryan P, Weiss M, Traxel N, Brondino M: **Testing the integrated theory of health behaviour change for postpartum weight management.** *J Adv Nurs* 2011, **67**(9):2047-2059.
26. Hsieh HF, Shannon SE: **Three approaches to qualitative content analysis.** *Qual Health Res* 2005, **15**(9):1277-1288.
27. Kondracki NL, Wellman NS, Amundson DR: **Content analysis: review of methods and their applications in nutrition education.** *J Nutr Educ Behav* 2002, **34**(4):224-230.
28. Jootun D, McGhee G, Marland GR: **Reflexivity: promoting rigour in qualitative research.** *Nurs Stand* 2009, **23**(23):42-46.
29. Dong Q, Wan S, Wang R, Guo S, Shen H, Wang N, Cai W, Cai L, Zhao W: **Knowledge, attitudes, and practices of pregnant and postpartum women regarding stress urinary incontinence.** *Sci Rep* 2025, **15**(1):24535.
30. Li T, Wang J, Chen X, Chen L, Cai W: **Obstetric Nurses' Knowledge, Attitudes, and Professional Support Related to Actual Care Practices About Urinary Incontinence.** *Female Pelvic Med Reconstr Surg* 2021, **27**(2):e377-e384.
31. Chen L, Chen X, Luo D, Jin M, Hu Y, Cai W: **Performance of self-reported and unsupervised antenatal pelvic floor muscle training and its effects on postpartum stress urinary incontinence among Chinese women: a cohort study.** *Journal of International Medical Research* 2020, **48**(6):0300060520914226.
32. Weinert K, Plappert CF: **Pregnant Women's Knowledge of Pelvic Floor and Related Dysfunctions: A Scoping Review.** *Healthcare (Basel)* 2025, **13**(8).
33. Salmon VE, Hay-Smith EJC, Jarvie R, Dean S, Terry R, Frawley H, Oborn E, Bayliss SE, Bick D, Davenport C et al: **Implementing pelvic floor muscle training in women's childbearing years: A critical**

interpretive synthesis of individual, professional, and service issues. *Neurourology and Urodynamics* 2020, **39**(2):863-870.

34. Thoits PA: **Mechanisms linking social ties and support to physical and mental health.** *J Health Soc Behav* 2011, **52**(2):145-161.

35. Lee TY, Zhong Y, Zhou J, He X, Kong R, Ji J: **The outbreak of coronavirus disease in China: Risk perceptions, knowledge, and information sources among prenatal and postnatal women.** *Women Birth* 2021, **34**(3):212-218.

36. Sajadi KP, Goldman HB, Firoozi F: **Assessing Internet health information on female pelvic floor disorders.** *J Urol* 2011, **186**(2):594-596.

37. Barakat R, Pelaez M, Cordero Y, Perales M, Lopez C, Coteron J, Mottola MF: **Exercise during pregnancy protects against hypertension and macrosomia: randomized clinical trial.** *Am J Obstet Gynecol* 2016, **214**(5):649 e641-648.

38. Kim HK, Niederdeppe J, Graham M, Olson C, Gay G: **Effects of Online Self-Regulation Activities on Physical Activity Among Pregnant and Early Postpartum Women.** *J Health Commun* 2015, **20**(10):1115-1124.

39. Locke EA, Latham GP: **Building a practically useful theory of goal setting and task motivation. A 35-year odyssey.** *Am Psychol* 2002, **57**(9):705-717.

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