REVIEW

Attitudes and Perceptions of eHealth Among Female Patients with Urinary Incontinence and Healthcare Providers: A Systematic Review and Thematic Synthesis

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Aim: The objective of this systematic review was to synthesize qualitative evidence to explore the promoters and barriers to implementing eHealth interventions from the perspective of female patients with urinary incontinence and healthcare providers.

Background: Guiding patients to pelvic floor muscle training through eHealth can effectively improve urinary incontinence symptoms, and understanding the attitudes and perceptions of patients and healthcare providers is critical to the successful application of eHealth. However, systematic reviews that combine both views are lacking.

Design: A systematic review of qualitative research and thematic synthesis. This was reported following the Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) guidelines 2020.

Date Sources: The search period was from the establishment of the database to May 2024, and eligible English literature was searched in PubMed, Web of Science, Cochrane Library, Embase, CINAHL, PsycINFO, and MEDLINE databases.

Review Methods: Two researchers independently screened and included the literature and used the Critical Appraisal Skills Program tool (CASP) to evaluate the methodological quality of the included literature. Themes were developed using thematic synthesis.

Results: A total of nine studies were included, which included 678 patients and 13 healthcare providers. Four themes were condensed into ten categories: multiple motivations for eHealth use, diverse reasons for taking action, complex reasons for preventing action, and conflict in establishing eHealth use behaviors.

Conclusion: The majority of patients are enthusiastic about utilizing eHealth to train their pelvic floor muscles, although there are occasionally issues like low desire. Although some medical practitioners are not well versed in eHealth, their engagement can aid patients in making use of eHealth. The future should focus on the difficulties and needs of women with urinary incontinence during the use of eHealth exercise and improve the understanding of eHealth among healthcare personnel.

Keywords: urinary incontinence, eHealth, healthcare providers, perception

Introduction

According to the International Continence Society (ICS),[1] urinary incontinence (UI) is the involuntary leakage of urine from any cause. According to estimates, the prevalence of UI is between 17–30% in women over 20 and 38–50% in those over 60 worldwide. As people age, the prevalence of UI rises and eventually develops into a geriatric syndrome.[2] There is evidence that women with UI have higher rates of hospitalization, pressure ulcer incidence, and urinary tract infections,[3] which seriously affect their quality of life. While UI may not pose a serious risk to life, the discomfort, shyness, and low self-esteem that come with urine leakage can lead women to avoid social situations or to withdraw

785

entirely,[4,5] which has a severe impact on interpersonal relationships. As a result, it's important to dispel common myths and give women with UI early and efficient intervention.

The current suggested first-line therapy approach for UI is conservative treatment in combination with pelvic floor muscle training (PFMT) and lifestyle adjustments.[6,7] But only 25% of afflicted women seek medical attention, and of those, less than half choose to proceed with treatment.[8] This could be due to a variety of things,[9,10] including patients' beliefs that UI is a typical aspect of aging or their shame when talking to their doctors about the disease. In addition, there are also some factors that impede healthcare providers (HCPs) from providing the best treatment, such as lack of time, knowledge, and the feeling of being unable to guide PFMT.[11–13] Although HCPs have encountered obstacles in providing incontinence care, they think it is important to optimize the treatment of UI.[14]

As an emerging clinical resource, eHealth provides health services and information through the Internet and related technologies, and has gradually been applied in the field of UI management.[15] An increasing number of studies[16,17] have shown that eHealth contributes to health promotion, especially in supporting pelvic floor muscle training. Mobile applications help patients improve UI symptoms through personalized training programs and progress tracking.[18,19] In addition, the application of telemedicine platforms also provides doctor-patient interaction for patients and expands the coverage of medical resources.[20,21]

Several randomized trial studies[18,22,23] have shown that after women received Internet-based interventions or used mobile phone applications for PFMT, the severity of UI symptoms and the related quality of life were both significantly improved. Relevant qualitative studies[24–26] have also supplemented this; women with UI are positive about eHealth because this new technology increases their access to care, protects their privacy, and lowers barriers to treatment by not requiring face-to-face contact with HCPs.

In clinical practice, eHealth has not been applied very frequently though. Additionally, women with UI did not comply well with eHealth interventions. In the short term, about 64% of patients were able to follow PFMT, while only 23% were able to do so over the long run.[27] Previous investigations[28] have found that the treatment adherence of women with UI depends not only on their perception of the benefits of PFMT through eHealth and their self-efficacy but also on HCPs' attitudes towards eHealth. It follows that co-creation of a supportive environment to increase eHealth utilization from multiple sources, including female patients with UI themselves and associated HCPs, is critical to treatment. To the best of our knowledge, there are no systematic reviews exploring the attitudes and perceptions of women with UI and associated HCPs towards eHealth.

The Review
Aim
The purpose of this systematic assessment was to gather qualitative data for an integrative analysis, investigate the usage of eHealth barriers and facilitators, and look at the views of women with UI and HCPs regarding the implementation of eHealth interventions. It is intended to lessen the burden of symptoms, improve health outcomes, and raise the usage of eHealth among women with UI.

Study Design
The systematic evaluation of the retrieved qualitative evidence was conducted using meta-integration, and the results were registered on PROSPERO (registration number: CRD42024525579). The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analysis) 2020 standards[29] were adhered to in this investigation.

Search Strategy
Seven databases, including PubMed, Web of Science, Cochrane Library, Embase, CINAHL, PsycINFO, and MEDLINE, were searched by the computer system, and the search time was from establishment to May 2024. The search phrase combines terminology from the Medical Subject Heading (MeSH) with free text keywords. The full search strategy for the databases is available in Supplementary Material 1.

Inclusion and Exclusion Criteria

Based on the SPIDER tool[30] (sample, phenomenon of interest, design, evaluation, research type), we created a search strategy. The sample were female patients with various types of UI and related HCPs; the phenomena of interest were the experiences of female patients with UI who received eHealth interventions and the HCPs who were involved in their implementation; the study design included ethnographic, ethnographic, grounded theory, phenomenological, narrative, or descriptive studies; the evaluation included the experiences, attitudes, and perceptions of at least one of the patients and HCPs about the eHealth itself and the process of engaging in its use; and the type of study was qualitative, or the qualitative portion of a mixed study.

Exclude the literature that has been published repeatedly, the literature for which only the abstract is available and the full text cannot be obtained, non-journal literature, and the literature using a mixed-methods design in which the qualitative data cannot be separated.

Study Selection and Data Extraction

In order to eliminate duplicates, we loaded the search results into the literature management program EndNote X9. We then gradually eliminated the full text, abstract, and title in order to filter the results for final inclusion. Independently screening, extracting information, and cross-checking the literature were two evaluators (LZ and NL) skilled in evidence-based methods; in cases of disagreement, a third reviewer (RW) was called to aid in judgment. The literature retrieval and screening process is demonstrated through the PRISMA flowchart. The specific flowchart is shown in Figure 1. Author(s), publication year, nation, data collection and analysis technique, study type, aim, conceptual or theoretical framework, and key findings were among the details that were extracted.

Quality Appraisal

We used the Critical Appraisal Skills Program tool (CASP)[31] to evaluate the methodological quality of the final nine studies included. Further evaluation was carried out since the literature included in this study answered "yes" to both of the CASP tool's first two questions, which ask the researcher to assess the study's aim and the applicability of the research technique. The logic of the study process, consideration of ethical considerations, and rigor of data analysis were all thoroughly evaluated in the follow-up questions. Every included study was assessed separately by two evaluators (CS and LG), and in the event of a dispute, the two discussed coming to a consensus or seeking the opinion of a third evaluator (ZC).

Data Synthesis

All the data extracted from the included studies were managed with the help of Nvivo12 software, and two researchers (LZ and NL) conducted data analysis using thematic analysis. Thematic analysis is divided into three processes: text coding, developing descriptive themes, and creating analytical themes. According to the RETREAT[32] criteria, thematic analysis can combine personal experience in a strict yet flexible manner and is applicable to this review. Finally, a third researcher (RW) checked the accuracy of the coding and themes.

Assessing Confidence in the Review Findings

The GRADE-CERQual (Confidence in the Evidence from Reviews of Qualitative Research)[33] approach was used to assess confidence in each of the findings of the review by two reviewers (CS and LG). Each finding's overall level of confidence—that is, how well it represents the phenomenon of interest—is determined by evaluating the four elements of methodological limits, coherence, adequacy of data, and relevance. As per CERQual[34] guidance, the confidence level for all findings began at high and was downgraded to moderate, low, or very low based on the assessment of each of the four components.

Rigour, Trustworthiness, and Reflexivity

Our study only analyzed the introductions of the included literature, rather than the authors' viewpoints or interpretations. Attitudes and perceptions of women with UI and HCPs were prioritized in the case-by-case analysis to shed light on each of the different themes. Graduate students in nursing, research assistants, a doctor, and a university librarian make up the team. The team members have all received training in qualitative methodologies, and they have a wealth of clinical

experience in obstetrics and gynecology. The research team meets regularly to interpret the findings. Disagreements were resolved through discussion and evaluated by a third researcher as needed.

Results

Search results and Study Characteristics

According to the search strategy, 904 documents were found, and after de-weighting as well as further reading of the abstracts and full text, 9 documents[24–26,35–40] finally met the criteria, as shown in Figure 1.
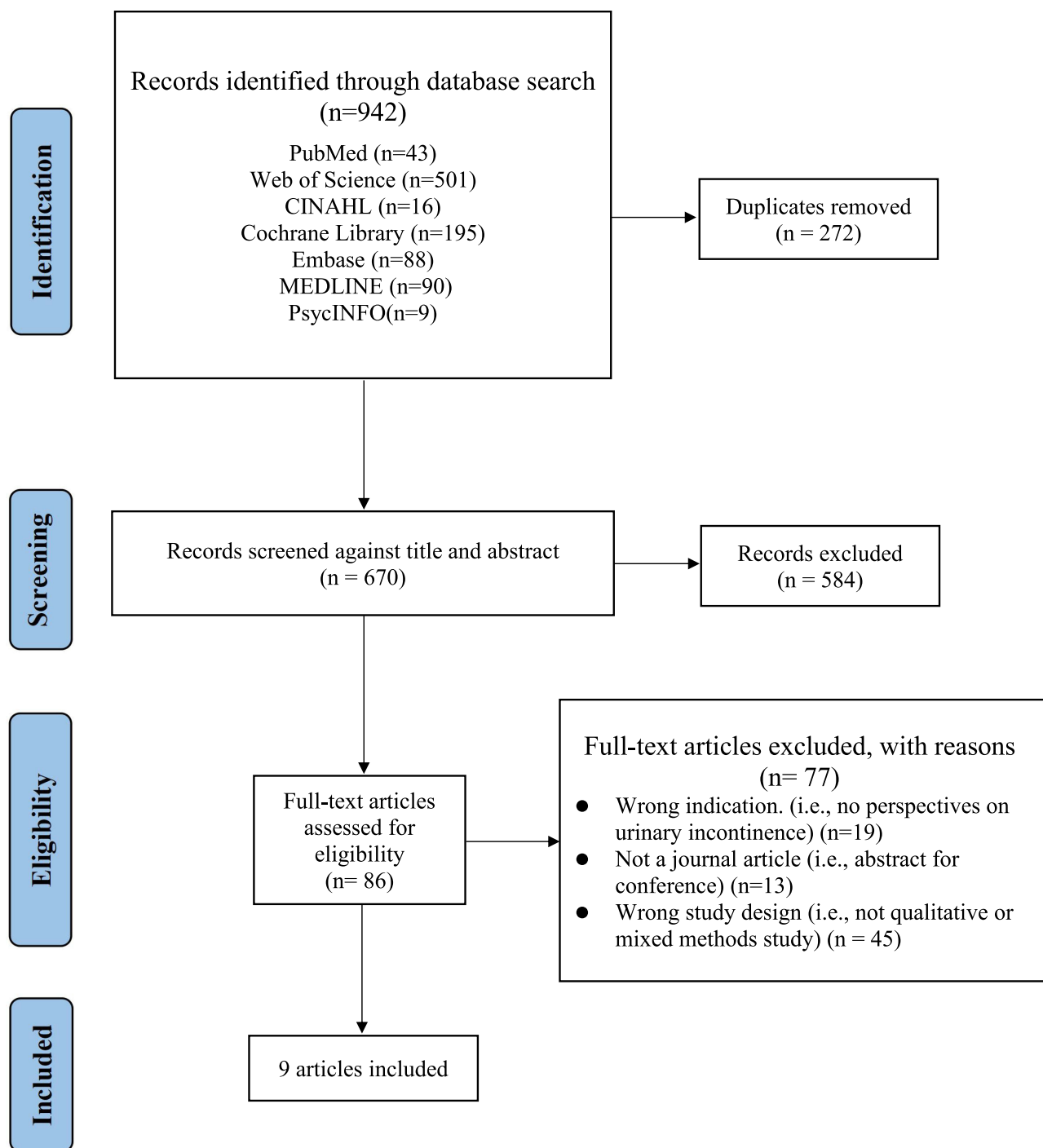

Figure 1 PRISMA flowchart of search strategy results.

Overall, the nine included papers included a total of 678 patients and 13 HCPs. All nine studies were published between 2014 and 2022, with six from Netherlands, two from Sweden, and one from Spain. Seven studies utilized a purely qualitative research methodology, and two studies reported qualitative data using a mixed-methods approach. Eight studies fall under phenomenological research within qualitative research, and one belongs to grounded theory research. And all of them have explored the attitudes and perceptions of UI women and/or HCPs towards eHealth, as summarized in Table 1.

Quality of Studies Included

The quality assessment of the included studies using the CASP tool revealed that almost all of the literature had minor or moderate methodological limitations. Most of the studies clarified the research objectives and applied qualitative methods appropriately. However, some studies did not specifically clarify the participant recruitment strategies, and some others did not disclose the relationship between the researchers and the participants. Detailed information on the assessment can be found in the Supplementary Material 2.

Confidence in Review Findings

The GRADE-CERQual approach was used to assess the confidence level of each finding in the review, with ratings of "high, moderate, or low confidence". There were a total of 10 finding categories, among which 8 categories were rated as "moderate or low confidence". The reasons for the downgrading varied, and most of them were caused by slight or mild methodological flaws or limitations in coherence, adequacy, and relevance. The relevant GRADE-CERQual summary tables are provided in Supplementary Material 3.

Findings

This study explores the opinions of women with UI and HCPs regarding eHealth by coding analysis and topic extraction of text data. The factors that promote and hinder the use of eHealth can be summarized as: multiple motivations for eHealth use, diverse reasons for taking action, complex reasons for preventing action, and conflict in establishing eHealth use behaviors.

Theme 1 Multiple Motivations for eHealth Use

Subtheme 1 Perceiving the Benefits of eHealth

Compared to conventional therapy approaches, eHealth offers more benefits. The majority of women with UI said they would be willing to use eHealth to proactively address urine incontinence since it was simple to obtain information, vivid and educational, and a low-cost treatment option.

> You always have to make an appointment to see your physiotherapist. And everyone's so busy these days that you think: why bother? And this gives you the support you need, because in theory it's available 24 hours a day. And I really liked that.[26]

> The videos are definitely useful. They show you how to exercise more efficiently. That makes it less a case of: [makes a sound expressing disgust] I have to exercise again. You just sit down and get on with it.[26]

> A key issue was also the easy-to-use technique with easily found start-buttons and no wires and very clear instructions.[40]

Women with UI also mentioned that eHealth is a new resource that gives them more options, makes up for the drawbacks of conventional treatments, and gives them more self-assurance in managing their incontinence.

> Devices help to improve the self-awareness of pelvic floor muscles by vaginal probe and by control over the use of the abdominal muscles, and allow better integration about the instructions given by the therapist.[40]

> It is always good to add a new tool to your assortment of treatment options.[39]

> Maybe eHealth could provide information about more [treatment] options or possibilities, those things you forget to ask [your GP].[38]

Table 1 Summary of Included Studies

Author/(Year)	Country	Participants	Data Collection Method (DC) and Analysis (DA)	Study Type	Study Aim	Conceptual/ Theoretical Framework	Main Findings
Asklund et al (2019)[24]	Sweden	P: N=15, F, Aged 27–72	DA: Grounded theory analysis DC: Individual, semi-structured telephone interviews	Qualitative Study	To explore women's experiences of using an app-based treatment program for SUI.	N/A	Theme1: "Three different women" experiences of using an app-based treatment program for SUI. Theme2: Core Category: Enabling My Independence. Theme3: Further Research and Implications for Practice.
Angls-Acedo et al (2021)[40]	Spain	P: N=22, F, Aged 29–71	DA: General thematic analysis DC: Think-aloud protocol and retrospective interviews	Qualitative Study	To describe patient-centered innovation in an early developmental stage of the WOMEN-UP solution, prior to future evaluation of functionality in a pilot study and future evaluation of efficacy in a randomized controlled trial.	Thematic label framework	Theme1: Qualitative Assessment: Identify Key Stakeholders' Needs. Theme2: WOMEN-UP Solution: First Prototype. Theme3: Usability Testing.
Björk et al (2014)[35]	Sweden	P: N=21, F, Aged 30–69	DA: Thematic coding analysis DC: Semi-structured individual telephone interviews	Qualitative Study	To explore how a postal treatment program for SUI was perceived and how the tendency to seek care and the patient-provider relationship were affected by the type of treatment given.	N/A	Theme1: Hidden but Present. Theme2: At a Distance but Close. Theme3: By Myself but Not Alone. Theme4: Acknowledged but Not Exposed.
Firet et al (2018)[38]	Netherlands	P: N=13, F	DA: Thematic analysis DC: Semi-structured face-to-face interviews	Qualitative study	To explore expectations regarding eHealth intervention among women who still suffered from SUI despite treatment.	N/A	Theme1: Need to meet. Theme2: eHealth as a tool to bridge obstacles.
Firet et al (2019)[39]	Netherlands	H: N=13 (F/M 9/4)	DA: Thematic analysis DC: Semi-structured interviews	Qualitative Study	To get insight into the GPs' attitudes towards an internet-based, eHealth, intervention for women with SUI.	N/A	Theme1: Appraisal of eHealth as a welcome new tool. Theme2: Mixed feelings about a supportive role. Theme3: eHealth is no cure-all.

Firet et al (2021)[25]	Netherlands	P: N=20, F, Average age 51	DA: Thematic analysis DC: Semi-structured telephonic interviews	Qualitative Study	To investigate the barriers and facilitators to the adoption of an eHealth, web-based, intervention for SUI among Dutch women.	"Task and Technology" (FITT) framework	Theme1: Interaction between users and eHealth. Theme2: Interaction between users and PFMT exercises. Theme3: Interaction between PFMT exercises and eHealth.
Firet et al (2022)[37]	Netherlands	P: N=561, F, Average age 50.3	DA: Content analysis DC: Semi-structured email or telephone interviews	Mixed Methods Study	To evaluate how an eHealth intervention for SUI is used and by whom, to explore reasons for nonusage attrition and to determine what factors are associated with usage.	N/A	Theme1: Reasons for Nonusage Attrition. Theme2: Factors Associated With Usage. Theme3: Facilitators and Barriers.
Wessels et al (2020)[26]	Netherlands	P: N=9, F, Aged 32–68	DA: Deductive and inductive analysis DC: Semi-structured in-person interviews	Qualitative Study	To explore the experiences and preferences of women regarding the use of this app and to seek their opinions about potential areas for improvement.	Technology Acceptance Model (TAM)	Theme1: Accessibility concerns the women's experience with access to UI health care with the app and the associated privacy. Theme2: Participants reported gaining greater awareness of their symptoms. Theme3: Participants from various ages and educational levels stated that the app was easy to use. Theme4: Most participants experienced adherence and motivation issues.
Wessels et al (2021)[36]	Netherlands	P: N=17, F, Aged 35–78	DA: Inductive analysis DC: Semi-structured telephone interviews	Mixed Methods Study	To explore the factors influencing app-based treatment for urinary incontinence and identify which barriers or facilitators are associated with treatment success or failure.	N/A	Theme1: Women in both groups felt that their adherence was directly related to the treatment effect. Theme2: Personality traits and attitudes toward app-based treatment. Theme3: Subthemes related to app factors. Theme4: There was increased awareness in several domains.

Abbreviations: F, Female; M, Male; H, Health professionals/providers; N/A, Not Applicable; N, Number; P, Patients.

Subtheme 2 HCPs' Words and Conduct

It's common to require expert assistance while starting something new. Women with UI said that encouragement to persevere with their eHealth decisions will come from a variety of social sources, particularly guidance and support from HCPs.

> For me personally, I need more encouragement to do the exercises, working with a therapist, for instance.[37]

> If you are going to implement eHealth into our practices, you will encounter resistance when we have to install the eHealth application ourselves […] that is the advantage of thuisarts.nl, which you can recommend to patients […] keep the doctor lazy. (HCP)[39]

If women with UI have no particular preference for pelvic floor exercises, some HCPs recommend eHealth as the primary treatment.

> Whether I recommend eHealth depends on the patient. Some women would prefer personal support by a specialized pelvic floor muscle physiotherapist […] but when they have no specific preference, I would suggest to start with eHealth. (HCP)[39]

Subtheme 3 Independent Physical Symptoms and Mental Health Requirements

Pelvic floor rehabilitation is essentially a process of self-management, and autonomous motivation is indispensable for behavioral change. Some patients' incontinence puts them in such danger that bodily symptoms force them to need medical attention. The patient's initial choice is frequently eHealth because it is readily available and has no negative effects.

> I just wanted to see if it is a remedy with a very easy approach […] I try to avoid the medical system as much as possible.[25]

> I thought I'd start trying to fix this problem through the internet. It is actually similar to a visit with the physiotherapist, when I went there for my shoulder I ended up doing certain exercises independently, without anyone's help.[25]

> Women should be in formed that if they have problems after delivery, or if they have a prolapse, before it gets worse […] Go to your doctor! Talk about it.[38]

In addition, some women with UI have turned to eHealth technology due to deeply ingrained customs, such as viewing incontinence as a private matter.

> I thought it would be very convenient to try the app, because this [urinary incontinence] is not something I would easily consult my general practitioner for. … It's just not something people talk about.[36]

> When my complaints become worse, I won't go [to the GP] again because I find it embarrassing to face that person again; that would make me choose the Internet – it gives you more privacy.[38]

Several women with UI claimed that they tried eHealth just to eliminate boredom or to quench their curiosity.

> Interviewer: what was the reason for keeping up your motivation? Interviewee: I enjoyed it because I was curious towards the new exercises. I think that was a good method, not seeing the whole program from the start. Every time you get something new, making you sort of curious to what is coming.[25]

> Or when I'm in the car, I have nothing to do, and I'm bored; during a long drive, for example. They are the kind of exercises you can do everywhere with no one taking notice.[36]

Theme 2 Diverse Reasons for Taking Action
Subtheme 4 Seeking Health and Reverse Stimulation

Although incontinence is not life-threatening, women with UI are reported to use eHealth prevention in order to pursue health and manage mild symptoms.

> I still use it [the app] and I'm going to carry on with it. I'm a bit of an overachiever, so I want to get to the highest level.[26]

> I started training again in my holidays, because this way I felt 'I would not have an excuse for not performing those exercises of 'Baas over je blaas' three times a day.[25]

> I saw it in a newspaper and thought it was a good idea, because I didn't have the kind of trouble where I would have sought help from the ordinary health care providers. I didn't think I had that much of a problem.[35]

The high frequency of UI and everyday moderate incontinence normalize the condition and ensure that it does not significantly interfere with daily living. Because of this, women who have UI claim that they frequently do not seek professional assistance or that they think their symptoms may go away on their own. Nevertheless, with time, the symptoms worsen, and the women with UI suffer immensely.

> But I was also triggered by it. I thought: wow, this is really much worse than I thought, because I always adapt to this incontinence.[26]

> I just got even more incontinent; it became even more unpleasant.[26]

> And how good are my muscles, how well have I trained them? You never know that, I don't think you ever get the answer sheet on that. Compared with others, or compared with people that don't have leakage. Are their muscles stronger than mine, and things like that?[24]

> Well, it does affect me, even though I haven't exactly suffered, it affects me.[35]

Subtheme 5 High Self-Efficacy

High self-efficacy is associated with high mobile health usage. While the question about the expected ability to perform PFMT is not a question of assessing self-efficacy, the two are approximate. The higher the expectations women had about their ability to perform the exercises, the more likely they were to choose eHealth to manage their incontinence.

> Having the home device allows greater availability and gives them autonomy, which facilitates the adherence to the PFMT.[40]

> I think the younger population, especially those after pregnancy […], would be open to this programme [eHealth] because they have a double job with a household. They have no time to visit a pelvic floor physiotherapist and they are capable of understanding such an eHealth programme. (HCP)[39]

> If people seem to understand eHealth, then age does not matter to me. […] I am against ageism. (HCP)[39]

Theme 3 Intricate Reasons to Delay Acting
Subtheme 6 Perceived Shortcomings of eHealth

Although eHealth has shown promise in helping patients control their own urine incontinence, several studies suggest that people reject or detest the technology due to insufficient information or misunderstandings about it.

> I don't feel confident with that thing, the computer, and with all the technology these days. […] I prefer not to do it [start with eHealth].[38]

> Pelvic floor muscle exercises are pretty tough. […] It's easy to pick the wrong muscles although you might be thinking you're doing well. It would be nice to have an expert to check it; the computer cannot do that.[38]

As eHealth is still in its early stages of study, individual requirements have not yet been adequately considered. Women with UI stated that they were irritated and turned off to eHealth since they were not reminded to exercise or incorporate it into their everyday activities.

> No, I felt those [reminders] were actually only annoying because I already had my own vision of when I was generally going to practice.[36]

> Well, to get it sorted, get a regular reminder, get the support day-in, day-out. Because there's so much other stuff that, well you know, life just goes on as it does, and then you end up never doing anything about it because it feels a bit uncomfortable.[24]

Sometimes I only practiced twice a day, because it is hard to combine it with your daily duties. For example, how would my colleagues react if I would lie down on the floor during work?[25]

Subtheme 7 Attitudes and Emotions of Surrounding People and Family Members

Support from close relationships such as spouses and family members had a positive effect on women's behavior change. Not only does it help promote a healthy lifestyle for women, but it also promotes greater mental resilience. But not all relatives are positive, and women with UI say the apathy of family and friends prevents them from seeking help from eHealth.

Well, I haven't explicitly looked for it, but since I was there I asked them and told them about my problems, but they didn't think there was much to be concerned about.[35]

I still try to do some training. I did it for so long that it became a routine. You sat there in the car contracting your muscles. Once, I sat on the couch and my daughter said, "Are you still doing your contractions?" Well, yes; the whole couch moves. Well, okay. It became a little bit like that; my whole family was dragged into this.[35]

Numerous forms of incontinence can be improved by eHealth, according to studies. However, in actual clinical practice, it is believed that elderly women or women with ambiguous diagnoses are not good candidates for adopting eHealth to improve urine incontinence due to the cognitive limits of HCPs, caused by the restrictions of patient age or diagnosis.

There are some people who stop feeling things beneath their diaphragm, so they have no clue of what happens down there. Of course, those people are not suitable for this eHealth. (HCP)[39]

eHealth is suitable only for specific patients if the diagnosis is correct. Therefore, patients with an overflow bladder should not use eHealth. Thus, the indication assessment has to be right before recommending eHealth. (HCP)[39]

I think mostly younger people would be helped by eHealth. However, urinary incontinence in older people is more common, and a number of these people do not even know how to start a computer. (HCP)[39]

Subtheme 8 Self-Inflicted Obstacles

Married women in Eastern nations are expected to take on extra housework in addition to their jobs, as well as to raise children and take care of the elderly. One of the biggest obstacles to pelvic floor health management is the tendency of certain women to put other people's needs—like family responsibilities or job demands—above their own, even to the point where pelvic floor management is neglected. Women with UI report that busy lives and heavy work take up almost all of their spare time, and even if e-health benefits do exist, they are difficult to implement.

I'm always busy with the kids.[26]

[About the app's strengths] 'Well, that it's quick and easy to do. But not if you've got a busy job, or a very busy private life.[26]

I had several other physical problems that were consuming my attention, so my impatience prevented me from focusing even more on myself.[37]

You get to a point of acceptance. Well, well, I am sixty-eight years old, and you get some ailments. Yes, and then you get some pads and you settle for that.[35]

Although some women with UI have conducted PFMT under the eHealth directive, the lack of face-to-face exercise guidance and feedback on the results with HCPs has raised doubts about whether the training method is correct and whether it is effective.

During the first contractions, you're thinking 'well, I think I'm doing alright'. But then at a certain point, you're thinking: 'I guess I'm contracting my buttocks, or my legs, and I don't feel anything happening inside'. *Giggling* Well, yeah I really doubted if I was doing the right thing.[25]

To me everything was clear because I'd seen a physiotherapist, but without that experience, you know, it is quite an area down there. Then I would think: 'How should you contract, should you contract in front, should you pull everything inside, how does it work with your rectum, that sort of thing'.[25]

It was pretty difficulty to do the exercises standing up. It took a while before I got the hang of this exercise. I didn't feel the muscle, as if it wasn't there.[37]

Theme 4 Conflicts in Building eHealth Use Behaviors
Subtheme 9 eHealth Offers Many Benefits
According to the survey, women with UI value eHealth because the new technology allows them to exercise at their own pace, independently, and without any restrictions. It also improves exercise experience and compliance by providing a frequent reminder system that is always there.

The advantage of the website is that you can do it in your own time and pace, I consider that as a great advantage. You do not have to plan an appointment.[25]

Even though it hasn't happened that much during the study time, I got a little bit better. I have gained a tool to use when I get time and decide to do this.[35]

I did not miss face-to-face contact at all […], but what I liked about the program was that they ask you every week 'where are you in the program?', 'how are you doing?' It feels like someone is helping you along, actually. That was really like coaching, like someone who is really involved. I thought that was a real strength.[25]

I think the advantage [of eHealth] is that you can do it at home, in your own environment. Whereas at the physiotherapist, it's quite something to lie down or sit on a table and do exercises while someone holds you and checks whether the exercises are going well.[38]

The advantages of eHealth extend beyond the person to the community. HCPs and women with UI agree that the rise of eHealth is a direct consequence of the digital era and that it will help ease the burden on society.

Everyone is on the Internet, so this [eHealth] fits into these digital times.[38]

It should be avoided that health insurance companies think: well, we have got eHealth, now we do not have to pay for other treatments anymore. (HCP)[39]

People who accept their urinary incontinence needed to be activated […] it is a social choice […] to reduce the amount of pads. (HCP)[39]

Subtheme 10 Demands Time Dedication
Exercises for pelvic floor rehabilitation take longer to see results, despite the many advantages of eHealth. Women with UI reported practicing on a regular basis to sustain observable or tangible outcomes.

Well, I certainly know what to do now to get results. I know that I have to do it for months, then it will work. That I understand.[36]

I just do it whenever I get off the train. It's like a Pavlov reaction, which might sound a bit strange, but it makes it very easy. I don't need to think about it because I'm doing it again and again[25]

Discussion
The purpose of this systematic review was to comprehensively analyze qualitative evidence, explore the promotion and obstacle factors of implementing eHealth intervention from the perspective of patients and HCPs, and carry out thematic analysis of the extracted data, resulting in a total of four themes. The findings demonstrated that the majority of female UI

patients had a favorable attitude about PFMT using eHealth and that the decision to take action was mostly based on personal motivation. The attitudes of HCPs as well as the counsel of friends, family, and neighbors also had a significant impact.

Because incontinence is so common and usually not severe, an increasing number of women are becoming numb to it, which contributes to the "normalization" of incontinence and lessens the significance of pelvic floor care. According to a Dutch study, just 13.1% of women attempted to seek help, despite the fact that 90% of women reported that their incontinence negatively affected their quality of life.[41] The most common reasons for not seeking help were feeling powerless because they thought leaking urine was an inevitable part of getting older,[42] and some women who had given birth thought leaking urine was a legacy of childbirth.[43] The concept of "normal" is typically derived from misperceptions held by some HCPs and intimate female friends or relatives who have given birth.[44] Therefore, it is necessary to strengthen health education for women to help them better understand urinary incontinence, pay more attention to their own health, and take active measures to prevent and treat urinary incontinence. HCPs can help patients reshape their perception of the disease, face their medical conditions objectively, and reduce their sense of stigma by means of acceptance and commitment therapy, cognitive behavioral therapy, peer support education, and other methods. According to studies,[45] social support from family members and those in the patient's immediate vicinity can significantly enhance the patient's emotional experience and boost their self-esteem and drive to manage their illness. HCPs should thus encourage family members to provide additional support and care as well as to actively participate in the daily care of their patients. Family members' involvement and support can help patients' emotional needs be met while also increasing their self-management awareness and skills, which will increase the efficacy of disease management.

eHealth is an emerging area of health care technology with an ever-growing number of apps to assist and monitor patients with various health complaints. Trust is a multifaceted and intricate term that is crucial to each relationship,[46] claim Fletcher-Tomenius and Vossler. Anonymity is a benefit of eHealth that can increase trust. Lack of in-person interaction can speed up the development of connections and lower the bar for talking about problems. Our study found that patients emphasize the convenience of using eHealth, which has been well demonstrated in previous studies.[47,48] The availability of eHealth makes it easier to interact, take notes, save time, and protect privacy compared to appointments in traditional healthcare. Patients who hold divergent views, however, claim that information obtained through eHealth regarding the timing of pelvic floor rehabilitation, exercise efficacy, and other particulars is either incomplete or inaccurate, leading to a lack of knowledge and assurance regarding the proper exercise of the pelvic floor muscles. According to earlier research,[49] some women utilizing eHealth are unable to contract their pelvic floor muscles correctly, while others have trouble finding information regarding pelvic floor care.[50] This feeling of unease may be exacerbated by the pelvic floor muscles' invisibility when practicing without feedback. Patients are at risk of losing motivation due to a lack of feedback and support. This highlights the need for having direct communication with HCPs. To guarantee the efficacy and safety of pelvic floor muscle workouts for women with UI, HCPs should give prompt, precise advice and feedback.

In addition, it should not be overlooked that eHealth, as an independent intervention, has its drawbacks. Firstly, there is a lack of formal diagnostic procedures,[39] which may lead some women, especially those with diseases other than UI, to wrongly start using eHealth for exercise. Although previous studies[51,52] have shown that women can accurately judge whether they have UI through questionnaires, we still encourage women to seek professional diagnosis from HCPs after preliminary screening. UI may coexist with other medical conditions such neurological illnesses, bladder troubles, or malfunctioning of the pelvic floor muscles. A professional diagnosis can improve the scientific nature of eHealth-based pelvic floor muscle training and help precisely identify the many forms of UI. It can also help create more individualized treatment strategies. Second, a significant problem with eHealth therapies is the absence of feedback devices. The inability of patients to determine if they have properly recruited the pelvic floor muscles persists even after they have received advice from health care professionals. Since the activation of the pelvic floor muscles is often invisible and subtle, many patients may not be able to clearly perceive whether they are using the correct muscle groups. The effects of treatment may be impacted if patients with this perceptual issue are unable to complete the training as intended. In order to help patients track their muscle activity in real time while exercising and make sure they are using the right training techniques, eHealth interventions must include efficient feedback mechanisms. Real-time muscle feedback from

technologies like wearables, muscle feedback devices, or smartphone apps can help patients better understand whether they are using the target muscles correctly, which will increase the efficacy of the interventions.

It is both affordable and accessible to provide PFMT via eHealth. According to earlier research,[53] using eHealth for periodic reminders can increase patient adherence to treatment. In contrast to women who simply received traditional physical therapy, women who received extra video and reminder interventions did not show any improvement in adherence and even caused disruption to their everyday lives, according to a randomized experiment.[54] Thus, more research is required to determine whether eHealth reminder techniques might increase pelvic floor rehabilitation behavior compliance.

UI is a prevalent yet frequently indescribable ailment. It is regarded as a benign sickness both in terms of culture and medicine. Some women experience embarrassment and shame, which can result in stigmatization. Overall, this might discourage women who desire therapy from getting it. Additionally, there's a chance that aspects related to healthcare could make women with UI even more stigmatized and marginalized. This study raises the possibility that HCPs have preconceived notions about the age and course of care for female incontinence patients. HCPs believe that younger women are better suited for eHealth interventions than older women because of their higher technical accessibility to eHealth. But a previous eHealth study[55] of women with stress incontinence showed that the probability of a successful outcome increases with age. And a Cochrane review[56] showed that PFMT is effective in women of all ages. Promoting the implementation of eHealth requires the trust of HCPs, and training should inform HCPs of these new therapeutic UI possibilities and correct common misconceptions about the care of women with UI. In addition, it is necessary to correct the concept that HCPs overly rely on some traditional treatment methods and are skeptical about new eHealth treatment means. HCPs can see the significant changes and potential benefits that eHealth brings to the care of women with UI by comparing the differences between new and old treatment methods in terms of treatment effects, patient compliance, medical costs, and many other aspects. This will enable them to actively participate in the promotion and application of eHealth and collaborate to improve the health status and quality of life of women with UI.

It is commonly established that factors influencing adherence to PFMT include self-efficacy and attitude toward exercise.[27] According to earlier studies,[57] women must have a specific level of self-efficacy in order to use UI for eHealth interventions. Prior to the start of an eHealth intervention, women should feel confident. This can be attained through the intervention itself or through improvements in HCPs. When HCPs refer to eHealth, they need to enhance the women's confidence in performing PFMT with web-based training and emphasize their ability as part of motivational interviewing. In addition, to further support women with UI in using eHealth, it is necessary to conduct a systematic evaluation of its feasibility and make technological improvements to the intervention measures when necessary and feasible. Firstly, there are significant differences among individual users, and customizing information according to user preferences is a crucial step. Moreover, in terms of page layout, using plain and easy-to-understand language is an important part of enhancing user experience and the effect of information dissemination. What's more, combining with animated explanations can add vitality and attractiveness to the eHealth platform.

Strengthens and Limitations

The following are some benefits of this system evaluation. Initially, we used extensive search algorithms to scan seven databases and thoroughly screen the publications, which included nine research projects. Secondly, we innovatively incorporated the views of HCPs on eHealth and comprehensively explored the barriers and facilitating factors in using eHealth to treat urinary incontinence from multiple perspectives. The research results of this article have put forward some new insights. In the end, all the included studies used the CASP quality assessment checklist, which was considered to be of high quality and increased the credibility of the results.

Nevertheless, there are some limitations to this article. Among the included literature, six papers are from Netherlands, a high-income country. Four of the studies were published by the same research group in different years. The concentration of the research samples may affect the external validity of the research results. Secondly, there is a lack of studies from low- and middle-income countries, and the sources of the samples are rather single. Moreover, the education levels of the interviewed women are generally high. Therefore, caution should be exercised when interpreting the research results. Lastly, the thematic analysis method highlights the potential influence of researchers on the analysis results. This means that researchers with different backgrounds and experiences may generate different themes when

conducting the analysis, thus limiting the universality of the research results. To increase the conclusions' external validation and wide application, future research should broaden the sample range as much as feasible to include studies from various nations and research teams.

Conclusion

This systematic review summarized qualitative evidence from the perspectives of women with UI and HCPs to identify promoters and barriers to eHealth use. The study's findings indicate that patients' low self-efficacy and lack of motivation are the primary barriers to using eHealth, and that women with UI are motivated to seek help from eHealth by HCPs' participation and support. However, this intervention is frequently underutilized due to HCPs' cognitive limitations with relation to eHealth. Based on the above findings, future research should focus on developing effective intervention measures to improve the acceptance and persistence of PFMT through eHealth among women with UI. In particular, increasing patients' motivation and self-efficacy and raising HCPs' understanding and involvement in eHealth therapies can both help to more successfully promote the use of this technology. The findings of this study have provided important implications for the optimization of eHealth interventions and emphasized their potential in the treatment of urinary incontinence. eHealth can not only offer convenient and cost-effective treatment options but also serve as a beneficial supplement to other treatment methods in routine healthcare.

Author Contributions

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

Disclosure

The authors have declared no conflicts of interest in this work.

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