REVISTA PORTUGUESA DE
ENFERMAGEM DE
REABILITAÇÃO

VOL. 9, Nº 1

Literature review

DOI - 10.33194/rper.2026.44180 | Electronic identifier – e44180

Submission date: 18-11-2025; Acceptance date: 19-04-2026; Publication date: 27-04-2026

TELEREHABILITATION INTERVENTIONS TO MANAGE POSTPARTUM URINARY INCONTINENCE: SCOPING REVIEW

INTERVENÇÕES DE TELERREABILITAÇÃO PARA A GESTÃO DA INCONTINÊNCIA URINÁRIA NO PÓS-PARTO: SCOPING REVIEW

INTERVENCIONES DE TELERREHABILITACIÓN PARA GESTIONAR LA INCONTINENCIA URINARIA EN EL POSPARTO: SCOPING REVIEW

Marta Braga[1]; Salomé Ferreira[2]; Tânia Manuel[1];
Maria João Guerra[3]; Armando Almeida[1]; Paulo Alves[1]

[1] *Faculdade de Ciências da Saúde e Enfermagem. Universidade Católica Portuguesa, Porto, Portugal*
[2] *Escola Superior de Saúde, Instituto Politécnico de Viana do Castelo, Viana do Castelo, Portugal*
[3] *Escola Superior de Enfermagem do Porto, Porto, Portugal*

Corresponding author: Marta Braga, s-masobraga@ucp.pt

How to cite: Braga M, Ferreira S, Manuel T, Guerra MJ, Almeida A, Alves P. Intervenções de telerreabilitação para a gestão da incontinência urinária no pós-parto: scoping review. Rev Port Enf Reab [Internet]. 27 de abril de 2026 [citado 18 de maio de 2026];9(1):e44180. Available on: https://doi.org/10.33194/rper.2026.44180

TECHNICAL FILE

eISSN: 2184-3023 pISSN: 2184-965X

www.rper.pt

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RESUMO

Introdução: A incontinência urinária é uma condição altamente prevalente entre mulheres no período pós-parto, com impactos físicos, psicológicos, sociais e económicos significativos. Apesar da eficácia do treino dos músculos do pavimento pélvico (PFMT) como tratamento de primeira linha, a adesão às intervenções convencionais permanece limitada. A telerreabilitação tem emergido como uma abordagem promissora para melhorar o acesso, o envolvimento e a adesão ao PFMT, através de tecnologias digitais. Embora a evidência apoie a sua eficácia na gestão da incontinência urinária em diferentes populações, ainda existem lacunas quanto à padronização de intervenções dirigidas a mulheres no pós-parto.

Objetivo: Esta scoping review tem como objetivo mapear e analisar as intervenções de telerreabilitação para o PFMT na gestão da incontinência urinária (UI) no pós-parto.

Métodos: Foi realizada uma scoping review seguindo o enquadramento do Joanna Briggs Institute para scoping reviews. Foi efetuada uma pesquisa abrangente em várias bases de dados, incluindo Medline Complete, CINAHL Complete, PubMed, Cochrane, Scopus, Web of Science e BASE, bem como em associações profissionais relevantes, como ICS, FIGO, EAU, SPG, APNUG, FSPOG e APU. Não foram aplicadas restrições temporais. Foram considerados para inclusão estudos envolvendo adultos no período pós-parto em contexto domiciliário, com foco em intervenções de telereabilitação para a gestão da incontinência urinária, disponíveis em acesso aberto e em texto integral, e com diferentes desenhos de estudo.

Resultados: Sete estudos foram incluídos nesta revisão, identificando sete abordagens distintas de telerreabilitação para PFMT direcionadas à gestão da UI no pós-parto. Estas intervenções recorreram sobretudo a aplicações móveis, dispositivos de biofeedback e ferramentas de monitorização remota para melhorar a adesão, fornecer educação e aumentar a força dos músculos do pavimento pélvico.

Conclusão: Esta revisão evidencia a eficácia e a viabilidade das intervenções de telerreabilitação na gestão da UI no pós-parto, suportadas por evidência de elevada qualidade proveniente de estudos randomizados controlados. A telerreabilitação melhora a adesão ao PFMT, disponibiliza recursos educativos interativos e oferece soluções acessíveis e economicamente eficientes para os cuidados no pós-parto. Investigações futuras deverão centrar-se nos efeitos a longo prazo destas intervenções, na integração de tecnologias emergentes como a inteligência artificial e na adaptação cultural, de modo a garantir acessibilidade e eficácia alargadas. Com a contínua evolução da saúde digital, espera-se que a telerreabilitação se torne um componente fundamental da reabilitação no pós-parto, oferecendo soluções inovadoras e escaláveis para a gestão da UI.

Descritores: Telerreabilitação, Incontinência Urinária, Treino dos Músculos do Pavimento Pélvico, Pós-Parto.

ABSTRACT

Introduction: Urinary incontinence is a common condition in the postpartum period, with a significant impact on quality of life. Pelvic floor muscle training (PFMT) is the first-line treatment; however, adherence to conventional interventions is often limited. Telerehabilitation has emerged as a promising strategy to improve access to and adherence to PFMT through digital technologies. Despite growing evidence of its effectiveness, gaps remain regarding the standardization of interventions for postpartum women.

Objective: This scoping review aims to map and analyze telerehabilitation interventions for PFMT in the management of postpartum urinary incontinence (UI).

Methods: A scoping review was conducted following the Joanna Briggs Institute framework for scoping reviews. A comprehensive search was performed across multiple databases, including Medline Complete, CINAHL Complete, PubMed, Cochrane, Scopus, Web of Science, and BASE, as well as relevant professional associations such as ICS, FIGO, EAU, SPG, APNUG, FSPOG, and APU. No time restrictions were applied. Studies involving postpartum adults in a home setting, focusing on telerehabilitation interventions for urinary incontinence management, available in open access and full text, and with different study designs were considered for inclusion.

Results: Seven studies were included in this review, identifying seven different telerehabilitation approaches for PFMT aimed at managing postpartum UI. These interventions primarily utilized mobile applications, biofeedback devices, and remote monitoring tools to enhance adherence, provide education, and improve pelvic floor muscle strength.

Conclusion: This review highlights the efficacy and feasibility of telerehabilitation interventions in postpartum UI management, supported by high-quality evidence from randomized controlled trials. Telerehabilitation enhances adherence to PFMT, provides interactive educational resources, and offers cost-effective, accessible solutions for postpartum care. Future research should focus on the long-term effects of these interventions, the integration of emerging technologies such as artificial intelligence, and cultural adaptability to ensure widespread accessibility and effectiveness. As digital health continues to evolve, telerehabilitation is expected to become a fundamental component of postpartum rehabilitation, offering innovative and scalable solutions for UI management.

Descriptors: Telerehabilitation, Urinary Incontinence, Pelvic Floor Muscle Training, Postpartum Period.

RESUMEN

Introducción: La incontinencia urinaria es una condición altamente prevalente entre las mujeres en el período posparto, con impactos físicos, psicológicos, sociales y económicos significativos. A pesar de la eficacia del entrenamiento de los músculos del suelo pélvico (PFMT) como tratamiento de primera línea, la adherencia a las intervenciones convencionales sigue siendo limitada. La telerehabilitación ha surgido como un enfoque prometedor para mejorar el acceso, la participación y la adherencia al PFMT mediante tecnologías digitales. Aunque la evidencia respalda su eficacia en el manejo de la incontinencia urinaria en diferentes poblaciones, aún existen lagunas en cuanto a la estandarización de intervenciones dirigidas a mujeres en el posparto.

Objetivo: Esta scoping review tiene como objetivo mapear y analizar las intervenciones de telerrehabilitación para el entrenamiento de los PFMT en la gestión de la incontinencia urinaria (UI) en el posparto.

Métodos: Se realizó una scoping review siguiendo el marco del Joanna Briggs Institute para scoping reviews. Se llevó a cabo una búsqueda exhaustiva en múltiples bases de datos, incluyendo Medline Complete, CINAHL Complete, PubMed, Cochrane, Scopus, Web of Science y BASE, así como en asociaciones profesionales relevantes como ICS, FIGO, EAU, SPG, APNUG, FSPOG y APU. No se aplicaron restricciones temporales. Se consideraron para su inclusión estudios que involucraran adultos en el período posparto en un entorno domiciliario, centrados en intervenciones de telerehabilitación para el manejo de la incontinencia urinaria, disponibles en acceso abierto y en texto completo, y con diferentes diseños de estudio.

Resultados: Se incluyeron siete estudios en esta revisión, identificándose siete enfoques diferentes de telerrehabilitación para PFMT dirigidos a la gestión de la UI posparto. Estas intervenciones utilizaron principalmente aplicaciones móviles, dispositivos de biofeedback y herramientas de monitorización remota para mejorar la adherencia, proporcionar educación y fortalecer los músculos del suelo pélvico.

Conclusión: Esta revisión destaca la eficacia y viabilidad de las intervenciones de telerrehabilitación en la gestión de la UI posparto, respaldadas por evidencia de alta calidad procedente de ensayos clínicos aleatorizados. La telerrehabilitación mejora la adherencia al PFMT, ofrece recursos educativos interactivos y proporciona soluciones accesibles y rentables para la atención posparto. La investigación futura debería centrarse en los efectos a largo plazo de estas intervenciones, en la integración de tecnologías emergentes como la inteligencia artificial y en la adaptación cultural, para garantizar una accesibilidad y eficacia amplias. A medida que la salud digital continúa evolucionando, se espera que la telerrehabilitación se convierta en un componente fundamental de la rehabilitación posparto, ofreciendo soluciones innovadoras y escalables para la gestión de la UI.

Descriptores: Telerrehabilitación, Incontinencia Urinaria, Entrenamiento de los Músculos del Suelo Pélvico, Posparto.

INTRODUCTION

Urinary incontinence is defined by the International Continence Society as any involuntary loss of urine. It can be classified into urge incontinence, characterized by a sudden, uncontrollable urge to urinate; stress incontinence, which occurs during physical exertion such as coughing, sneezing, or laughing; or mixed incontinence, where both urge and stress symptoms coexist [1,2].

It is estimated that approximately 50% of the adult female population suffers from urinary incontinence, with only 25-60% seeking treatment. The lack of demand is often due to shame, lack of knowledge about treatment options or fear of possible surgery [3].

This is one of the most frequent complaints in the puerperium [4,5]. Its occurrence is related to hormonal and anatomical changes and to factors such as: vaginal delivery, time of labor, number of deliveries, newborn weight, maternal age and obesity, which lead to puerperal women being considered a risk group for their development [4,5]. Epidemiological studies show that the prevalence of urinary incontinence in the postpartum period varies between 3 and 34% and about 73% of women maintain severe complaints 6 years after delivery [4,5].

This clinical situation has a profound impact on well-being, self-esteem and quality of life [3,6]. People diagnosed with urinary incontinence are predisposed to the development of depression, anxiety, work difficulties and sexual dysfunction, often leading to social isolation [3,6]. In addition to the above, urinary incontinence also entails relevant economic costs, both for the national health system and for the individual. These costs are directly related to diagnosis, hygiene products and treatments [3,6].

PFMT, are an effective treatment for pelvic floor disorders such as urinary incontinence. They are recommended, along with lifestyle education and bladder training, as first-line treatment and can be performed at home or in consultation, with the accompaniment of a qualified health professional [7,8].

Telerehabilitation is defined as the use of remote technologies through mobile phones, computers or television applications to solve problems related to users' access to rehabilitation [9]. Although this type of rehabilitation proves to be effective, reducing costs, increasing the involvement of users in treatments and showing good results, it is still undervalued [9].

The literature highlights the need for further research on telerehabilitation for pelvic floor muscle training to improve urinary loss. Evidence suggests that the use of mobile technologies for the conservative self-management of urinary incontinence is beneficial, with positive effects on symptom improvement, satisfaction, adherence and costs (level 2 evidence) [8].

In addition, a study conducted in China demonstrated that primiparous women who performed pelvic floor muscle training using an audio-guided application achieved better outcomes and greater adherence compared to those performing the exercises without the application [10]. These findings are consistent with those of a systematic review comparing telerehabilitation-based PFMT interventions with traditional approaches, which reported higher adherence among participants using telerehabilitation. The same review also highlights that telerehabilitation remains an emerging and developing field, requiring further research[11].

In the initial search, limited to MEDLINE via PubMed, no type of review was found on telerehabilitation interventions used for the treatment of postpartum urinary incontinence. However, some studies of telerehabilitation in women at other stages of life have been shown to be effective in the treatment of urinary incontinence [11].

In the present study, the conceptual framework is informed by Dorothea Orem's Self-Care Theory and Afaf Meleis' Transitions Theory, as nursing theoretical references particularly relevant to understanding the rehabilitation processes associated with postpartum urinary incontinence [12,13]. These theories support the central role of women in managing their condition by promoting self-care, autonomy, and adaptation to the changes inherent to this stage of the life cycle. Furthermore, they reinforce the role of rehabilitation nursing specialists in empowering, supporting, and facilitating healthy transitions, thereby contributing to a holistic, individualised, and evidence-based approach [14].

In this context, telerehabilitation may represent a complementary tool to remotely support, monitor, and guide pelvic floor muscle training. Nevertheless, the systematic integration of these technologies into nursing practice and their actual impact on care delivery remain insufficiently explored.

Therefore, the objective of this scoping review is to map and analyse telerehabilitation interventions for pelvic floor muscle training in the management of postpartum urinary incontinence. This review was guided by the following research question: "What are the telerehabilitation interventions used to manage postpartum urinary incontinence?". In addition, the specific objectives were to identify and characterize the different types of telerehabilitation interventions associated with pelvic floor muscle training used in this context, and to analyse the available evidence regarding their effectiveness, adherence, and impact on women's quality of life in the postpartum period.

METHODS

The realization of this Scoping Review followed the methodology of the Joanna Briggs Institute [15] and the guidelines established by the PRISMA extension for Scoping Reviews (PRISMA-ScR) [16]. The topics include the population to be included in the survey, the formulation of the research question, the eligibility criteria, and the strategy and databases used to obtain the relevant information. The completed PRISMA-ScR checklist is provided as a supplementary file. Our protocol is available on OSF (https://osf.io/3bevp).

The definition of the starting question followed the strategic parameters P (Population - postpartum women experiencing urinary incontinence), C (Concept - telerehabilitation interventions focused on pelvic floor muscle training (PFMT)), C (Context - home-based management and rehabilitation of urinary incontinence through remote technologies) [17], and the research was guided by the following question:

"What are the telerehabilitation interventions used to manage postpartum urinary incontinence?"

INCLUSION CRITERIA

This scoping review considered studies that included adult participants, i.e., aged eighteen years or older, with no age limit, who were in the postpartum period, at home. Studies that explored telerehabilitation interventions that can be performed to manage postpartum urinary incontinence were included. To this end, qualitative, quantitative and mixed studies were considered, as well as randomized clinical trials, prospective studies, retrospective, cohort, case studies, descriptive studies and systematic reviews. In addition, protocols and guidelines were also included.

EXCLUSION CRITERIA

Studies that were not available in full and in open access were excluded.

RESEARCH STRATEGY

The research strategy used aimed to find both published and unpublished primary studies, systematic reviews, case studies, protocols, and guidelines.

A comprehensive search strategy was developed based on the Population–Concept–Context (PCC) framework. Four main concept blocks were defined: telerehabilitation, pelvic floor muscle training, urinary incontinence, and postpartum period. These blocks were combined using Boolean operators. The

general search equation is presented below and was adapted to the syntax of each database.

Search equation:

(telerehabilitation OR "tele-rehabilitation" OR "remote rehabilitation" OR "virtual rehabilitation" OR telehealth OR telemedicine OR mhealth OR ehealth OR "mobile application" OR app* OR smartphone* OR "internet-based" OR "web-based" OR online OR "remote monitoring" OR biofeedback OR "at home") AND ("pelvic floor" OR "pelvic floor muscle*" OR PFMT OR "pelvic floor muscle training" OR "pelvic floor muscle exercise*" OR "Kegel exercise*") AND ("urinary incontinence" OR UI OR "stress urinary incontinence" OR "urge urinary incontinence" OR "mixed urinary incontinence") AND (postpartum OR postnatal OR puerperium OR "postpartum period")*

During November 2023, the search was carried out in several databases, such as *Medline Complete*, *CINAHL Complete, PubMed, Cochrane, Scopus*, Web of Science and BASE. In the same period, a search for *guidelines* and protocols was carried out in the associations that work with the content, namely ICS, FIGO, EAU, SPG, APNUG, FSPOG and APU. Considering the inclusion criteria, articles were selected, without time limitation, by two independent reviewers using Rayyan [18], according to titles and abstracts.

After study selection, data were extracted using a structured data charting form developed by the reviewers, in accordance with the Joanna Briggs Institute framework for scoping reviews. Data extraction was performed by two independent reviewers and included the following variables: authors, year of publication, country, study design, sample size, type of telerehabilitation intervention, and main outcomes related to urinary incontinence.

Subsequently, the data were analysed using a descriptive and thematic approach. A narrative synthesis was conducted to map and summarise the characteristics of the included studies. The results were organised into categories according to the type of intervention and reported outcomes, allowing the identification of patterns, similarities, and differences across the included studies.

ETHICAL CONSIDERATIONS

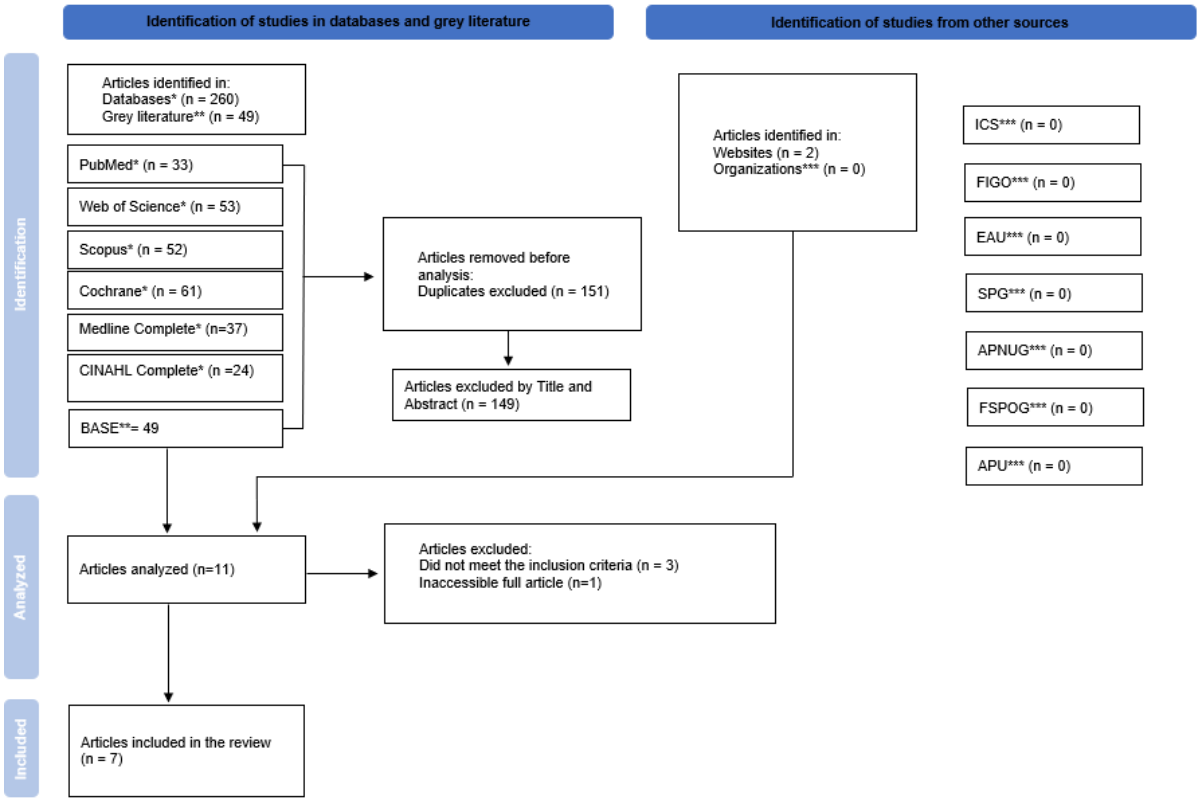
Given the characterization of the study, in which participants are not included, there are no ethical implications to be considered.

RESULTS

After the search, the studies were grouped in Rayyan, and those that were duplicated were automatically removed (n=151), later 149 articles were excluded after reading the title and abstract because they were not articles on telerehabilitation in the postpartum UI, and 11 articles were analyzed in full, of which 4 were excluded - 3 they did not use telerehabilitation and 1 it was not available in open access.

Scheme 1 presents the PRISMA diagram, in which the articles initially identified, the entire selection process and the 7 final articles included in this scoping review are verified.

Figure 1: PRISMA diagram



Of the 11 articles analyzed, 7 were included, with publication dates between 2018 and 2023: 14% (1) in 2018, 14% (1) in 2019, 29% (2) in 2020, 14% (1) in 2022, and 29% (2) in 2023.

Table 1: Level of evidence from studies

Level of evidence	Studies	Frequency	Percentage
I	Systematic review and meta-analysis of randomized controlled trials; Clinical Guidelines Based on Systematic Reviews or Meta-Analyses	0	0%
II	Randomized controlled trials	5	71%
III	Non-randomized clinical trial	0	0%
IV	Case studies and cohort studies	2	29%
V	Systematic review of descriptive and qualitative studies	0	0%
VI	Descriptive or qualitative study	0	0%
	Total	7	100%

Considering the type of study and the level of evidence, most randomized controlled trials were found (5), level of evidence II. The remaining studies found (2), case studies and cohort studies, level of evidence IV.

Of the 7 articles included in the study, 3 were conducted in China (43%), and the rest were developed: in Japan (14%), Canada (14%), Russia (14%) and a multicenter (14%).

For the analysis of the articles, data was extracted using a tool developed by the reviewers. This extraction was performed by two independent reviewers, and the relevant data included are presented in Table 2.

Table 2: Included articles and relevant results

Title	Year	Study design	Setting	Sample	Intervention
App-based pelvic floor muscle training in pregnant and postnatal women: A prospective cohort study exploring factors associated with prevention and improvement of urinary incontinence [19]	2022	Prospective cohort study	Multicenter	982	• Mobile App Tät®. • Program of 12 exercises for the training of PFMT that increase in intensity and difficulty. • It contains lifestyle advice, information on SUI, pelvic floor, and incontinence-related factors.

Title	Year	Study design	Setting	Sample	Intervention
Device-assisted pelvic floor muscle postpartum exercise program for the management of pelvic floor dysfunction after delivery [20]	2020	Prospective, randomized, open-label study	Russia	70	• Devices: EmbaGYM e Magic Kegel Master. • EmbaGYM it emits weak electrical impulses that stimulate the genitofemoral nerve branches, resulting in PFM contraction. • Magic Kegel Master It is a peanut-shaped silicone vibrating device controlled by Bluetooth by smartphone. The APP records muscle pressure through sensors and provides instructions to the user. • 20 minutes of training per day.
Effect of app-based audio guidance pelvic floor muscle training on treatment of stress urinary incontinence in primiparas: A randomized controlled trial [10]	2020	Randomized controlled trial	China	108	• Device: Pen Yi Kang – APP audio guide • This APP contains a home training module, which consists of an audio guide for systematic exercises. • 4 training levels: primary, medium, intense and mixed. • The audio guide guided users to contract and relax their muscles in a regular and concrete way, with synchronized music. • The APP displays a dynamic graph indicating contraction and relaxation. • Sends reminders during the workout period.
Effect of Internet combined with pelvic floor muscle training on postpartum urinary incontinence [21]	2023	Prospective, randomized, blinded, controlled study	China	38	• Application: WeChat • Group A received oral and written instructions; • Group B was guided by therapists through videos on WeChat; • Group C was instructed to perform Pilates through WeChat; • All groups trained daily for 60 minutes over a period of 2 months;
Exploring the Impact of a Mobile Health Solution for Postpartum Pelvic Floor Muscle Training: Pilot Randomized Controlled Feasibility Study [22]	2019	Pilot Randomized Controlled Feasibility Study	Canada	23	• Application: mhealth + iBall • Designed to facilitate TMPP • Detects strength, PFM resistance • The information is transmitted via Bluetooth to a smartphone APP that guides users to various exercise programs • No schedules were established, but all participants were motivated to perform 3 sets of 10 exercises, 3 or 4 times per week, during the intervention period (16 weeks).

Title	Year	Study design	Setting	Sample	Intervention
Effect of Pelvic Floor Muscle Training with Smartphone Reminders on Women in the Postpartum Period: A Randomized Controlled Trial [23]	2023	Randomized controlled trial	China	148	• Application: WeChat • The intervention group received messages with reminders to perform the exercises at 9 am, 2 pm and 6 pm, as well as videos of orientation of the PFMT.
Smartphone-based reminder system to promote pelvic floor muscle training for the management of postnatal urinary incontinence: historical control study with propensity score-matched analysis [24]	2018	Case-control study	Japan	58	• App: RtimeTM system • Reminder APP, sends 1 time of a day at 9 am to remind the intervention group to carry out the PFMT.

It is possible to observe several interventions in the 7 studies. Most articles refer only to interventions aimed at PFMT, however some have also intervened in health education, namely in terms of lifestyle, UI, pelvic floor and factors related to incontinence. In addition to the above, some of the studies showed the importance of reminders throughout the day for the performance of the PFMT and others made it possible to clarify doubts, which proved to be an added value.

DISCUSSION

This scoping review aimed to identify and analyze telerehabilitation interventions for UI in the postpartum period. The review included seven studies published between 2018 and 2023, highlighting the growing interest and advances in this area. Most studies consisted of randomized controlled trials (RCTs) (71%), indicating a high level of evidence on the efficacy of these interventions.

GEOGRAPHICAL DISTRIBUTION AND CULTURAL CONSIDERATIONS

The geographic distribution of the studies, with a significant number conducted in China (43%), followed by Japan, Canada, Russia, and a multicenter study, highlights the global interest in telerehabilitation for postpartum UI. However, it also suggests the need to consider cultural and regional differences in the design and implementation of these interventions. For example, the use of specific applications and devices may vary based on local technology adoption and patient preferences. In addition, cultural attitudes toward postpartum care and UI may influence the uptake and effectiveness of these interventions [25–27]. Local adoption of technologies and patient preferences should be considered in the design and implementation of these approaches.

CLINICAL APPLICATIONS AND EDUCATIONAL TOOLS FOR SELF-CARE

The Tät® app [19] It is a fairly complete tool that contains four types of contractions and twelve exercises with increasing levels of intensity and difficulty. He recommends performing the exercises three times a day for three months. It promotes adherence to the therapeutic regimen through reminders that can be set from one to three times a day, it also allows you to set individual training goals and according to the programmed objectives, it allows the visualization of a calendar with statistics and feedback of the workouts depending on whether or not they are performed. This app includes health education content that will range from tips to identify pelvic floor contraction, to information on: pregnancy, postpartum and prolapse.

The Magic Kegel Master Device [20] Combined with its application, it contains a training guide with four levels of intensity, which allows you to monitor the strength of the pelvic floor muscles constantly, making it possible to monitor the performance of the exercises, containing biofeedback. It also includes teaching about pelvic floor muscles, a facilitating tool for health education. The same study compares the previously mentioned device with the EmbaGYN device [20] which emits weak electrical impulses with the aim of stimulating the genitofemoral nerve branches, resulting in PFM contraction. In this study, the workouts consisted of a series of twenty minutes per day, lasting four

weeks. The pelvic floor muscles were evaluated before and after the intervention; and the users were followed up weekly via telephone to evaluate the progress, strengthening communication and thus providing positive reinforcement in adherence to the therapeutic regimen.

The Pen Yi Kang app [28], it consists of an audio guide of systematic exercises, divided into four levels of intensity. This tool guides the contraction and relaxation of the pelvic floor muscles in a regular and concrete way, accompanied by a graph, which allows awareness. This application emphasizes the importance of adherence to the therapeutic regimen through reminders. In this study, the mobility of the bladder neck and the strength of the pelvic floor muscles were evaluated through electromyography and vaginal palpation, at six weeks, three and six months postpartum. The participants were advised to perform the workouts twice a day for three months. Therefore, the researchers optimized communication through monthly calls, to clarify doubts and encourage the participants to maintain adherence to the therapeutic regimen.

The iBall device in conjunction with the mhealth app [22], are designed to facilitate the PFMT. They allow the strength and resistance of the muscles to be detected, and this information is transmitted via Bluetooth to the application, which guides users in the training of the pelvic muscles. It also contains biofeedback and the progress of the workouts is saved and can be followed by the researchers, as it sends the data to a server. In this study, no schedules were established, the participants were free to decide the frequency and duration of the training, however, all were advised to perform them three or four times a week, three sets of ten exercises, in a period of sixteen weeks. Halfway through the intervention period, participants received an email with a reinforcement session regarding iBall resources and teachings on the benefits of continuing PFTM.

WeChat [21,23] and RtimeTM system [24] were applications used in three of the studies found, which aim to promote adherence to the therapeutic regimen through daily reminders to perform PFMT. In the study by Chu L. at al (2023) e Wang J. at al. (2023) health education was also carried out through the sending of orientation videos for the performance of PFMT [21,23]. In the last study mentioned, communication through WeChat was made possible, to optimize communication by clarifying doubts.

Devices such as Pen Yi Kang and iBall offer similar features, integrating biofeedback and remote monitoring that allows monitoring by health professionals. Studies indicate that interventions with these devices are promising in terms of efficacy and adherence, especially when there is continuous support and motivational reinforcement during the process [22,28]. These tools reflect the potential of interactive technologies to promote a more personalized and effective rehabilitation experience.

QUALITY OF LIFE AND SEXUALITY

The benefits of telerehabilitation go beyond improving UI symptoms. All the studies analyzed highlight the increase in quality of life, either directly or indirectly. It is understood that the fact that complaints associated with UI decrease is a factor that indirectly increases the quality of life, as the effects at a psychological, social, economic and professional level decrease or disappear. The reduction of symptoms, by improving the quality of life of women, also promotes psychological, social and even sexual benefits [20,28]. Studies reveal that sexual dysfunction decreased considerably in groups that used devices such as Magic Kegel Master and EmbaGYN, reflecting a positive impact on the participants' intimate lives and self-image [20,21]. Artymuk et al. (2022) report that after the implementation of the telerehabilitation program, the group that used Magic Kegel Master had a decrease in sexual dysfunction from 69.4% to 25.0% and the group that used EmbaGYNTM had a reduction from 55.9% to 44.1% [20]. In the study by Wang et al. (2020) found that in the Female Sexual Function Index the scores were significantly higher in all domains in the intervention group [28]. These secondary results in terms of sexuality are extremely important, considering the group studied (postpartum women), as they are women of reproductive age, and sexual dysfunction can have an impact on quality of life both personally and in their intimacy with their partner. Therefore, it is understood that telerehabilitation has a positive effect on increasing the quality of life of these women in different dimensions. These findings suggest that pelvic rehabilitation may play an important role in increasing the self-esteem and well-being of postpartum women.

CHALLENGES IN ADHERENCE AND ACCEPTABILITY

An important point is that, although telerehabilitation expands access and offers flexibility, adherence can be a challenge. Telerehabilitation allows groups with more difficulties in accessing rehabilitation not to be unable to carry it out, however the lack of direct monitoring by health professionals was a demotivating factor for some participants [22, 23]. Adherence to PFMT is one of the primary challenges of telerehabilitation. Several studies showed that using digital reminders and remote monitoring significantly increases adherence. In a randomized study, women who received daily WeChat reminders had a PFMT adherence rate of 53.9%, compared to only 20.8% in the control group ($p < 0.001$) [18].There are some factors to take into account so that it does not become a demotivating treatment, as shown by the study by Wang et al. (2023), in which she understood that the lack of follow-up by health professionals

led to demotivation and abandonment on the part of patients [21]. The same treatment, when guided by health professionals, has been shown to be effective in improving UI symptoms and increasing the strength of PFMs. In some cases, technical difficulties with devices limited acceptance, highlighting the importance of a design that is easy to use and clear in the instructions. Evidence from several studies such as Dufour et al. (2019) where the results obtained did not support the use of mHeath, since the users pointed out technical failures and difficulties in using the device correctly as a demotivator [22]. The complaints included: lack of clarity in the instructions, failure to transmit data and monitoring, a probe that was too large and uncomfortable, difficulty in handling, placing and cleaning the probe, and finally, lack of confidence in the device and results due to the lack of monitoring by qualified professionals. In the same study, the following positive points were pointed out: constant feedback and games, which proved to be challenging and motivating. Finally, in the study by Kinouchi et al. (2018) there was a high dropout rate, which the researchers think could be overcome if, in addition to receiving daily reminders to perform the exercises, the participants had benefited from periodic monitoring by a health professional [24]. Another study evaluated the impact of a biofeedback device (iBall) and found that, while most participants recognized the value of the technology, 77% reported technical difficulties and discomfort, negatively affecting adherence [23]. Additionally, the literature highlights that factors such as clear instructions, an intuitive interface, and continuous remote support are crucial for maintaining patient motivation [24]. These results indicate that the combination of continuous support, simplified design, and clear instructions can optimize treatment acceptance and efficacy.

TELEREHABILITATION INTERVENTIONS

Interventions in the studies reviewed focused primarily on PFTM, which was delivered via various mobile applications and devices. These interventions employed technology to provide structured exercise programs [19], real-time feedback [20], and motivational reminders [23,24], all of which are essential components for effective UI management. The use of mobile applications, such as Tät®, WeChat, and mHealth solutions, has shown considerable potential to enhance PFMT adherence, offering advantages and personalized guidance [19,21,22]. It was evident that the combination of PFMT with other techniques, such as Pilates, guided by apps or the internet, also proved effective. The study by Wang et al. compared different approaches, highlighting significant improvements in UI symptom severity and reduced pad use between groups [21].

EFFECTIVENESS OF TMPP APPLICATIONS

Several studies have highlighted the effectiveness of application-based PFMT programs. For instance, the Tät® app featured a 12-week exercise regimen with increasing intensity, lifestyle advice, and educational content on UI and pelvic floor health [19]. This comprehensive approach has not only facilitated muscle training but has also addressed lifestyle factors that contribute to UI, reflecting a holistic treatment strategy. The use of devices such as EmbaGYM and Magic Kegel Master further illustrates the role of technology in the PFMT [20]. These devices provided electrical stimulation and real-time feedback on muscle contractions, thereby enhancing the quality and effectiveness of the exercises. These innovations underscore the potential of integrating biofeedback and physical devices into telerehabilitation to optimize outcomes [20,22].

ROLE OF REMINDERS AND EDUCATIONAL COMPONENTS

The significance of reminders and educational components has been evident in several studies. Interventions employing WeChat and the Rtime™ system sent regular reminders to participants, substantially enhancing adherence to PFMT [21,23,24,28]. Additionally, the educational content provided through these applications contributed to increasing participants' understanding of UI and the importance of PFMT, empowering them to adopt an active role in rehabilitation. These reminders also assisted in establishing a routine, which is vital for the success of any rehabilitation program [28].

BENEFITS AND CHALLENGES OF TELEREHABILITATION

Telerehabilitation offers numerous benefits, including increased accessibility, flexibility, and cost-effectiveness [9,29]. Patients can perform exercises in the comfort of their homes, which is particularly advantageous for postpartum women who may have limited mobility or time [27]. Furthermore, the asynchronous nature of many of these interventions allows users to engage with the program at their convenience, thereby increasing uptake.

However, several challenges must be addressed for the potential of telerehabilitation to be fully realized. Technological literacy and access can pose significant barriers, particularly in under-resourced populations [30]. Ensuring data privacy and security is another major concern, as these applications may contain sensitive health information [31]. Additionally, the lack of direct physical supervision can impact the accuracy and effectiveness of exercises performed by users. Implementing systems that protect users' health information and promote privacy is essential to maximize the safety and acceptance of telerehabilitation interventions.

IMPLICATIONS FOR NURSING PRACTICE

The findings of this scoping review have several implications for nursing practice, as the integration of telerehabilitation tools facilitates continuous and accessible support for postpartum women. The integration of telerehabilitation into nursing practice provides significant benefits for continuous support to postpartum women. Remote training offers greater flexibility, reducing barriers such as time constraints and travel difficulties, which are critical for new mothers [21]. Integrating tools in nursing care can enhance the support provided to postpartum women experiencing UI. Performing exercises at home offers a greater opportunity for successful treatment, as PFMT is low-cost and carries minimal risk, while communication between professionals and patients is optimized through telerehabilitation. Nurses can play a crucial role in guiding patients in the use of these applications, monitoring progress, and providing personalized feedback and motivation. Furthermore, the health education incorporated in these interventions can be directed by nurses to inform patients about pelvic floor health, contributing to improved long-term outcomes [32].

FUTURE RESEARCH DIRECTIONS

Future research should concentrate on examining the long-term effects of these interventions and their sustainability. Comparative studies between various types of telerehabilitation interventions can yield insights into what may be most effective. Moreover, research ought to explore methods to address identified barriers, such as enhancing technological literacy and ensuring equitable access to these interventions [26,29,30]. It would also be advantageous to investigate the integration of artificial intelligence and machine learning to provide more personalized and tailored rehabilitation programs [30]. Comparative studies of different types of telerehabilitation interventions (apps versus biofeedback devices) can clarify the effectiveness of each approach and aid in the development of more targeted and efficient interventions.

POLICY IMPLICATIONS

For telerehabilitation to be fully integrated into postpartum care, policies to support the development of digital infrastructure and data security regulations are essential. This includes investing in digital health infrastructures, ensuring regulated data security and privacy standards, and promoting training programs for healthcare professionals to use these tools effectively [30,31]. By fostering an environment that supports telerehabilitation, health systems can improve the quality of care offered to postpartum women, ultimately improving their quality of life.

STRENGTHS AND LIMITATIONS

Overall, the findings of this scoping review highlight both the strengths and limitations of telerehabilitation interventions for the management of postpartum urinary incontinence. Among the main strengths are their accessibility, flexibility, and relatively low cost, as well as the possibility of program personalization and the promotion of women's autonomy throughout the rehabilitation process. In addition, the use of reminders, educational content, and remote monitoring systems contributes to strengthening motivation, adherence, and continuity of treatment. These features support the development of more patient-centred and sustainable rehabilitation models.

However, despite these advantages, relevant limitations remain. These include the lack of in-person supervision, difficulties associated with technology use, the need for continuous technical support, and challenges in maintaining long-term adherence. Such barriers may compromise the effectiveness of interventions, particularly among women with limited digital literacy or restricted access to technological resources. Addressing these limitations is therefore essential to optimise the implementation and long-term impact of telerehabilitation programmes in postpartum care.

CONCLUSION

Telerehabilitation for postpartum urinary incontinence represents a promising and feasible approach. The available evidence, largely derived from randomized controlled trials, suggests that telerehabilitation interventions associated with PFMT—such as mobile applications, biofeedback devices, and digital platforms—can improve treatment adherence, reduce urinary incontinence symptoms, and enhance women's quality of life.

Despite these benefits, challenges related to technical support and the need for ongoing professional monitoring remain. Nevertheless, telerehabilitation offers an accessible and flexible home-based alternative, particularly relevant for postpartum women.

Overall, telerehabilitation for postpartum urinary incontinence emerges as a promising and effective approach. Future research should explore the sustainability and long-term effects of these interventions, as well as the integration of artificial intelligence to further personalise rehabilitation programmes, potentially establishing telerehabilitation as a key component of postpartum care.

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ETHICAL DISCLOSURES

Contribuição do(s) autor(es):
Concetualização: PA, SF, SB
Investigação: PA, SF, SB, TM
Metodologia: PA, SF, SB, TM
Administração do projeto: PA, SF, SB
Supervisão: PA, SF, SB
Validação: PA, SF, SB
Visualização: PA, SF, SB
Redação do rascunho original: PA, SF, SB
Redação - revisão e edição: PA, SF, SB, MJG, AA
Todos os autores leram e concordaram com a versão publicada do manuscrito.

Financiamento:
Este trabalho não recebeu nenhuma contribuição financeira ou bolsa.
Comissão de Ética:
Não se aplica.
Declaração de consentimento informado:
Não se aplica.
Conflitos de interesse:
Os autores não declaram nenhum conflito de interesses.
Proveniência e revisão por pares:
Não comissionado; revisto externamente por pares.