REVIEW ARTICLE

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Nonpharmacological treatment of postpartum sexual dysfunction: a systematic review and meta-analysis

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INTRODUCTION

Postpartum is a vulnerable period for women, in which they are faced with many new changes and concerns. The latter period is marked by a series of physiological and psychological changes that directly influence a woman's quality of life and sexual function[1-3]. The prevalence of postpartum sexual dysfunction is high. Studies have indicated that approximately 20–60% of postpartum women experience some type of sexual dysfunction that can last for several months after delivery[4-7].

Such symptoms can be complex and delicate to treat, commonly requiring a combination of different techniques. Especially during the puerperal period, nonpharmacological strategies are necessary to treat sexual dysfunction since there are no clinical studies that demonstrate the safety of pharmacological therapies, especially since there is a risk of passing several drugs to the newborn through breast milk[8]. Nonpharmacological therapies, such as pelvic floor exercises, sex and couples therapy, psychotherapy, lifestyle changes, and the use of vaginal lubricants or moisturizers, are among the most popular treatment options[8-10].

Several clinical trials involving the non-pharmacological treatment of postpartum sexual dysfunction have been published[11,12]. However, despite the importance of treating postpartum sexual dysfunction for women's quality of life, no systematic review has yet attempted to reach a consensus on the optimal nonpharmacological approach.

Therefore, the present systematic review and meta-analysis aimed to determine the effectiveness of different nonpharmacological interventions in the treatment of sexual dysfunction in postpartum women.

METHODS

This systematic review was designed and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines[13] by the authors ACQA, AKSG, and MNM. The study analyzed data from previously published clinical trials and, thus, did not require ethical approval or patient-informed consent. The protocol for this study was published in an indexed journal[14].

Searches in bibliographic databases were conducted in line with guidelines developed for systematic reviews and meta-analyses under the supervision of an experienced librarian at the Sectorial Library of the Health Sciences Center of the Federal University of Rio Grande do Norte. The following databases were consulted: PubMed, Embase, Scopus, Web of Science, Cochrane Central Register of Controlled Trials, CINAHL, PEDro, and clinical trial.gov, utilizing the Medical Subject Headings (MeSH) "non-pharmacological therapies," "postpartum period," and "sexual dysfunction." The final search was conducted on February 28, 2023.

Study selection

The following inclusion criteria were defined: (1) randomized clinical trial (RCT), (2) women >18 years of age, (3) women with sexual problems that began in the puerperium, and (4) nonpharmacological interventions: REDI Model, EmbaGYN Model, Kegel Model, PLISSIT, Cognitive-Behavioral, Routine Training, Levine's Model, Interactive Postpartum Sexual Health Education Program (IPSHEP), Sexual Health Educational, Women's Postpartum Sexual Health Program (WPSHP).

Other types of studies, such as case reports, narrative reviews, editorials, commentaries, letters, or randomized clinical trials

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that did not meet the inclusion criteria and those with insufficient data to be extracted, were excluded.

The articles retrieved by the search were imported to the Ryyan software for identification and duplicate exclusion. After that, two authors (ACZS and RO) independently reviewed all titles and abstracts, followed by a full text review against the eligibility criteria. Agreement on potential relevance or inconsistencies was reached by consensus or resolved by discussion with a third reviewer (ACAS).

Data extraction

Two authors (ACQA and ACZS) independently extracted the relevant data from the full text of eligible articles after comparing results and resolving any discrepancies, and the data were reviewed by a third reviewer (AKSG).

The data collected included the duration of symptoms and rates of improvement in sexual dysfunction, which was defined as the presence of pain, increased difficulty reaching orgasm, lack of arousal, poor lubrication, and low desire.

Assessment of risk of bias

Two authors (ACAS and RO) independently assessed the risk of bias of the included studies using the Cochrane Collaboration risk of bias tool (RoB2) for RCTs. Bias was considered high, low, or unclear[15]. A third author (MNM) resolved possible inconsistencies between the assessments.

Data synthesis

Review Manager (RevMan) V.5.4.1 was used to perform the meta-analysis. The weighted mean difference (MD) with a 95% confidence interval (CI) was calculated for continuous data to obtain a summary of the overall estimate. Heterogeneity was assessed using the I^2 statistic. A random-effects model was adopted due to the high heterogeneity observed among studies[16].

The quality of the 22 included articles was assessed according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) guidelines. Two authors (ACAS and ACQA) independently performed this assessment, and disagreements were decided through discussion with a third author (AKGS)[17,18].

RESULTS

Study selection

The database searches identified a total of 5,390 articles. Of these, 1,604 were excluded for being duplicates, and 3,764 did not meet the inclusion criteria. Therefore, 22 studies that met the eligibility criteria were included in the systematic review. Of these, eight composed the meta-analysis. The study selection is summarized in the PRISMA flowchart (Figure 1).

Study characteristics

The 22 elected articles included 2,227 participants with sexual dysfunction in the postpartum period. Of these articles, 13 were from Iran[19,20,22,24,26,27,32,34,38,40], 4 from Turkey[25,30,31,33], 1 from Taiwan[21], 1 from Norway[23], 1 from India[29], 1 from Germany[39], and 1 from the Russian Federation[28]. All 22 articles were RCTs, and their characteristics are summarized in Table 1.

Risk of bias of the included studies

Of the included articles, the risk of bias assessment showed that eight studies met all items of the RoB2 and were, therefore, classified as "low risk of bias"[19-26]. Meanwhile, 13 were considered to have "some concerns" due to the lack of information regarding intention-to-treat, deviation, or missing outcome data[27-39]. One study was classified as "high risk" due to bias in selecting reported results[40] (Figure 2).

Synthesis of results

A total of 22 studies[19-40] were included in the systematic review, of these 8[19,24,29,31,36,38-40] were included in the meta-analysis, involving a total of 634 patients.

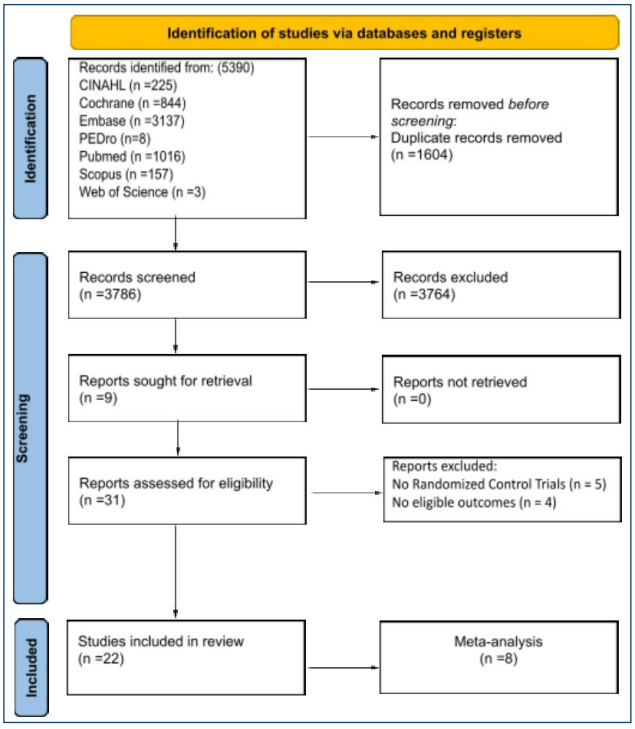

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses flowchart study selection.

Table 1. Characteristics of the included studies.

Authors, years	Countries	No. of patients	Mean age	Intervention types	Instrument measures	Follow-up
Aghababaei et al.[27]	Iran	98	30.18	IG: REDI Model. CG: educational package	FSFI and DSDS	4 weeks
Artymuk et al.[28]	Russia	70	29.85	IG: EmbaGYN Model. CG: Kegel Model	FSFI and PFDI-20	4 weeks
Banaei et al.[19]	Iran	87	24.18	IG: PLISSIT. CG: routine consultation	FSFI, EPD, and Larson's scale	4 weeks
Bhat et al.[29]	India	55	29.88	IG: Kegel Model. CG: without intervention	FSFI	6 months
Bokaie et al.[30]	Turkey	79	29.88	IG: Telephone counseling. CG: without intervention	WSFQ and Larsson's scale	5 Weeks
Citak et al.[31]	Turkey	75	22.60	IG: PFME. CG: without intervention	FSFI	7 months
Erfanifar et al.[32]	Iran	84	22.15	IG: Cognitive-behavioral. CG: routine training	FSFI and SEQ	8 weeks
Evcili et al.[33]	Turkey	67	26.40	IG: Levine's Model. CG: without intervention	IFSF, ASEX, and GRISs	6 weeks
Golmakani et al.[20]	Iran	79	25.88	IG: Kegel Model. CG: without intervention	Brink scale and BSEQ	8 weeks
Karimi et al.[34]	Iran	80	30.70	IG: PLISSIT. CG: without intervention	FSFI and DASS-21	2 weeks
Karimi et al.[35]	Iran	80	30.50	IG: PLISSIT and BETTER. CG: without intervention	FSFI and HSSI	4 weeks
Lee et al.[21]	Taiwan	250	31.73	IG: IPSHEP. CG: routine training	PWSS, DAS, and SS	3 months
Malakouti et al.[40]	Iran	68	27.00	IG: PLISSIT. CG: without intervention	FSFI	8 weeks
Modarres et al.[36]	Iran	100	30.30	IG: Kegel Model. CG: without intervention	FSFI	16 weeks
Movahedi et al.[37]	Iran	114	26.59	IG: PFME. CG: without intervention	PDFI-20	16 weeks
Pourkhiz et al.[41]	Iran	84	25.65	IG: PFME. CG: without intervention	FSFI, SQQL-F, and Oxford score	3 months
Schütze et al.[39]	Germany	200	31.94	IG: PFME. CG: without intervention	FSFI, PFQ, and Oxford score	6 weeks
Sheikhi et al.[22]	Iran	94	20.52	IG: Sexual health educational. CG: routine training	FSFI	8 weeks
Kolberg Tennfjord et al.[23]	Norway	175	29.80	IG: PFME. CG: without intervention	ICIQ-VS and ICIQ-FLUTSsex	6 weeks
Torkzahrani et al.[24]	Iran	90	24.18	IG: PLISSIT. CG: without intervention	FSFI	4 weeks
Yörük et al.[25]	Turkey	123	27.30	IG: PLISSIT. CG: without intervention	Arizona scale and SQLQFF	2 months
Zamani et al.[26]	Iran	75	29.45	IG: WPSHP. CG: routine training.	DASS-21 and Larson's scale	8 weeks

IG: intervention group; CG: control group; PFME: pelvic floor muscle exercise; DSDS: Decreased Sexual Desire Scale; FSFI: Female Sexual Function Index; PFDI-20: Pelvic Floor Distress Inventory; EPD: Edinberg Postpartum Depression; WSFQ: Women's Sexual Function Questionnaire; SEQ: Sexual Self-efficacy Questionnaire; IFSF: Index of Female Sexual Function; ASEX: Arizona Sexual Experience Scale; GRISs: Golombok-Rust Inventory of Sexual Satisfaction; BSEQ: Bailes Sexual Self-efficacy Questionnaire; DASS-21: Depression, Anxiety, and Stress Scale-21; HSSI: Hulbert Sexual Self-disclosure Index; PWSS: Postpartum Women's Sexual Self-efficacy; DAS: Diversity of Sexual Activity; SS: Sexual Satisfaction; SQQL-F:Sexual Quality of Life Questionnaire-Female; PFQ: Pelvic Floor Questionnaire; ICIQ-VS: Incontinence Modular Questionnaire—vaginal Symptoms Questionnaire; ICIQ-FLUTSsex: ICIQ Sexual Matters Module; SQLQFF: Sexual Quality of Life Scale-Female Form.

Regarding the sexual dysfunction outcomes evaluated, the articles included in the meta-analysis used the Female Sexual Function Index (FSFI) to estimate improvement. Of the interventions assessed in the meta-analysis, three RCTs performed experimental pelvic floor muscle exercise protocols[31,38,39] and showed no improvement in favor of the intervention group (MD: 4.27; 95%CI 1.23–7.32; I^2: 99%). The three RCTs evaluating the PLISSIT (Permission, Limited Information, Specific Suggestion, and Intensive Therapy)[19,24,40] showed no improvement in favor of the experimental group (MD: 1.56;

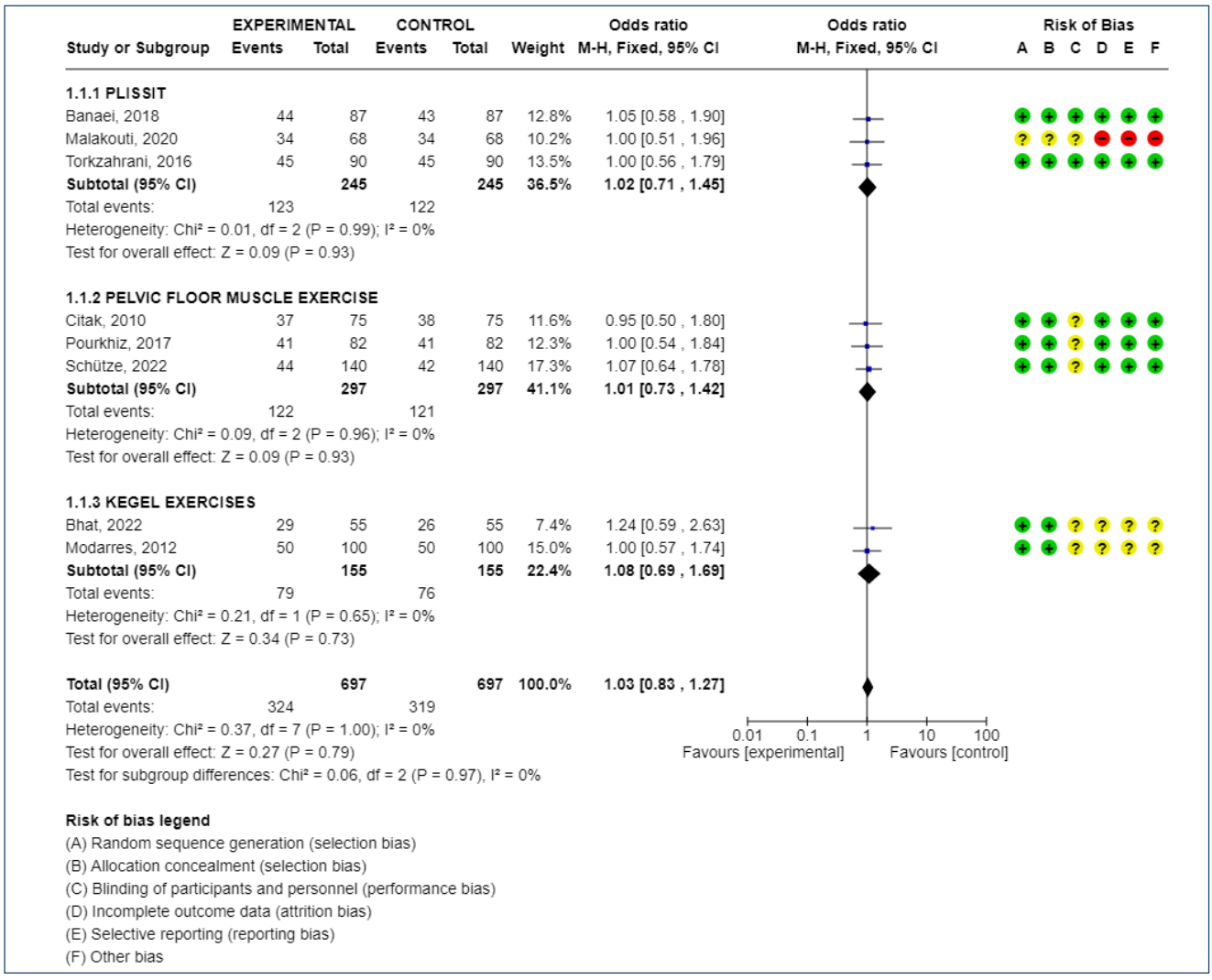

Figure 2. Risk of bias assessment.

95%CI 1.27–1.84; I^2: 0%), and the two RCTs evaluating Kegel exercises[29,36] also showed no improvement in favor of the intervention group (MD: 41.54; 95%CI 33.27–49.80; I^2: 99%).

Assessment of quality

The GRADE rating for the certainty of the evidence for improvement of sexual function outcomes using PLISSIT was considered high, while for Kegel and pelvic floor muscle exercises it was considered very low due to the high inconsistency and imprecision of the data, large confidence interval ranges, and consequently, a high degree of heterogeneity between the studies (Table 2).

DISCUSSION

The current systematic review examined clinical trials of different protocols that investigated the effectiveness of nonpharmacological methods in the treatment of sexual dysfunction in postpartum women. Changes in postpartum sexual life are highly prevalent and of concern as they negatively affect the quality of life of these patients. In this review, we analyzed a wide variety of treatment protocols for postpartum sexual dysfunction.

All interventions studied showed some improvement in the FSFI domains (desire, arousal, lubrication, orgasm, satisfaction, and pain). Concerning the PLISSIT model and Kegel exercises, all studies demonstrated improvement in FSFI domains; however, the latter was not significant in the meta-analysis. Additionally, RCTs involving the PLISSIT intervention show that sexual problems in lactating women have decreased[19,24,25,34,35,40].

Studies using the Kegel exercise technique showed a significant increase in pelvic floor muscle strength after the treatment period, concluding that muscle exercises using the Kegel method increase sexual self-efficacy in postpartum women[20,29,36].

Table 2. Evaluation of the quality of articles according to Grading of Recommendations Assessment, Development and Evaluation.

Certainty assessment							No. of patients		Effect		Certainty	Importance
No. of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	PLISSIT	Placebo	Relative (95%CI)	Absolute (95%CI)		
Sexual function (assessed with: FSFI)												
3	Randomized trials	Not serious	Not serious	Not serious	Not serious	None	123	122	–	Mean 1.56 (1.27 higher to 184 higher)	⊕⊕⊕⊕ High	Critical

Certainty assessment							No. of patients		Effect		Certainty	Importance
No. of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Pelvic Floor Muscle Exercise	Placebo	Relative (95%CI)	Absolute (95%CI)		
Sexual function (assessed with: FSFI)												
3	Randomized trials	Not serious	Very serious[a]	Not serious	Very serious[b]	None	122	121	–	Mean 4.27 higher (1.23 higher to 7.32 higher)	⊕◯◯◯ Very low	Critical

[a]I2: 99%.
[b]95%CI: 1.23–7.32.

Certainty assessment							No. of patients		Effect		Certainty	Importance
No. of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Kegel	Placebo	Relative (95%CI)	Absolute (95%CI)		
Sexual function (assessed with: FSFI)												
2	Randomized trials	Not serious	Very serious[a]	Not serious	Very serious[b]	None	79	76	–	Mean 41.54 higher (33.27 higher to 49.8 higher)	⊕◯◯◯ Very low	Critical

[a]I2: 99%.
[b]95%CI: 33.27–49.80.

An RCT that evaluated electrostimulation on pelvic floor muscles for 4 weeks showed that the technique significantly reduced sexual dysfunction in the treated group[28]. Furthermore, the REDI model showed that the overall FSFI score increased in the treated patients, consequently implying an improvement in the sexual function of this group. However, there was no difference in the orgasm subdomain when comparing the intervention and placebo[27].

In addition, women who received postpartum sexual health education based on the IPSHEP program tended to resume their sex lives earlier but did not differ significantly from those who received routine education[21].

Likewise, Levine's model showed that the intervention group had better sexual function and developed a more satisfactory sexual response than the control group[33]. Regarding the results of the RCT that carried out health counseling by telephone,

there was an improvement in the satisfaction and sexual function of the patients[30].

Concerning the WPSHP, we found higher levels of sexual satisfaction, thus being recommended for women to use this program during postpartum to improve sexual function[26]. Finally, the cognitive-behavioral assessment showed that 8 weeks after the intervention, there was a difference between the two groups, demonstrating that adequate implementation of counseling based on the cognitive-behavioral therapy model improved the sexual function of nulliparous women after childbirth[32].

The results of our meta-analysis regarding pelvic floor muscle exercise differ from data presented in other meta-analyses[7,8]; specifically, no superior effect of this exercise compared to the placebo intervention could be evidenced. Individually, the RCTs that addressed pelvic floor muscle exercises for sexual dysfunction had positive effects on the FSFI global score and subdomains[22,23,31,37-39]. Two previous meta-analyses have evaluated the effectiveness of pelvic floor muscle exercises on postpartum sexual dysfunction: one conducted in Canada involving 15 RCTs[8] and the other in Iran encompassing 12 RCTs[7]. These studies highlighted that pelvic floor muscle training in primiparous or multiparous women can increase sexual function and quality of life in the postpartum period, thus contradicting the outcomes of the present analysis.

The results for the effect of the PLISSIT model and Kegel exercises also showed no superior effect compared to the placebo intervention. However, this is the first meta-analysis performed on these interventions to address this topic. RCTs involving the PLISSIT intervention show that sexual problems in lactating women decreased. Overall, the studies conclude that the use of the PLISSIT model is recommended in health-care settings, promoting improvement in sexual dysfunction[19,24,25,34,35,40].

Studies using the Kegel exercise technique demonstrated a significant increase in pelvic floor muscle strength after the treatment period and concluded that muscle exercises with the Kegel method increase sexual self-efficacy in postpartum women[20,29,36].

Considering the high prevalence of sexual dysfunction among women in the postpartum period[4,9,12], treatment of this condition has been highly valued by the World Health Organization in recent years. The results of our study may be useful for the decision-making of professionals who work directly with these patients—mainly gynecologists and obstetricians—as well as for epidemiologists who discuss public policies aimed at the well-being of this population worldwide.

Our study is the first systematic review aiming to analyze all nonpharmacological treatment options available for sexual dysfunction in postpartum. However, despite the interesting findings, some limitations must be mentioned. Firstly, we identified a risk of bias in some RCTs due to the lack of blinding and incomplete description of the results. Additionally, we detected a high level of heterogeneity among the studies, such as different follow-up times and the use of several measuring tools, compromising the quality of meta-analysis.

CONCLUSION

Our meta-analysis showed that the treatment of postpartum sexual dysfunction using Kegel exercises, pelvic floor muscle training, or PLISSIT did not provide superior effects compared to using the placebo intervention. Considering the impact of this condition on women's quality of life, this study reinforces the need for more RCTs to increase the quality of evidence and guide clinical practice.

AUTHORS' CONTRIBUTIONS

ACQA: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Software, Visualization, Writing – original draft. **ACAS:** Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization, Writing – original draft. A**KG:** Conceptualization, Formal Analysis, Methodology, Project administration, Software, Supervision, Writing – original draft, Writing – review & editing. **RO:** Data curation, Software. **ACZS:** Data curation, Software, Validation.

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