Review Article

Postnatal Exercise and its Role in Managing Maternal Depression and Anxiety

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Abstract

Background: Two of the most common mental health conditions in the postpartum phase are postpartum depression and postpartum anxiety, which frequently impact domestic life, infant attachment, and maternal well-being. According to recent research, non-pharmacologic interventions specifically, structured exercise—are crucial for maintaining maternal mental health.

Objective: the main goal of this review is to evaluate how structured postpartum exercise regimens affect women's postpartum anxiety and depression symptoms.

Methods: Postnatal exercise, postpartum anxiety, postpartum depression, and maternal mental health were searched in literature using Pub Med, Scopus, and Google Scholar exhaustively. Meta-analyses, systematic reviews, and randomized controlled trials of studies from 2015 to 2025 were included.

Discussion: Walking, yoga, stretching, and aerobic training are examples of gentle to moderate physical exercise, which are linked with improvement in mood regulation, balance of cortisol and serotonin levels, self-esteem, and social support. Exercise improves the physical and mental recovery of postpartum women when added to routine care.

Conclusions: Exercise after childbirth is an innocuous, valuable, and efficient adjunct therapy for decreasing depression and anxiety among mothers. Systematic exercise is able to improve mother screening outcomes, increase the health of families, and provide long-term recuperation when incorporated into daily postpartum care.

Keywords: Postnatal Exercise, Postpartum Depression, Postpartum Anxiety, Maternal Health, Mental Health.

Introduction

The puerperal, or postpartum, phase is a period of vulnerability during which women undergo marked physiological, hormonal, and psychological changes as the body gradually readjusts to its pre-pregnant state.(1) While this is universally known to be a time of heightened emotional closeness between

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child and mother, it is accompanied by heightened risk for psychiatric illness, particularly postpartum depression (PPD) and postpartum anxiety (PPA).[2]

Globally, PPD affects approximately 15–20% of new mothers, whereas PPA prevalence is 13–18%, with far greater rates being reported in low- and middle-income countries. [3] Not only does this compromise maternal well-being but also infant growth, family functioning and healthcare costs. [4]

Conventional management is primarily composed of pharmacotherapy and psychotherapy. Despite this, side effects of drugs, problem of medication safety in lactation, stigma, and lack of access to mental health professionals on a regular basis frequently impede proper care.[5] these obstacles have prompted growing interest in complementary and non-pharmacologic interventions.[6]

Physical exercise has more and more come to be known for its multifaceted and more than unidirectional impacts on mood stabilization, stress reduction, and physical healing.[7] Systematic reviews and meta-analyses conducted in recent years consistently demonstrate that structured exercise can serve both as a preventative and therapeutic intervention for maternal depression and anxiety. [8]

With this in perspective, this review attempts to analyze the pathophysiologic mechanisms, risk factors, diagnostic approaches, and treatment for PPD and PPA with emphasis on postnatal exercise as evidence-based care.[9]

Methods

Protocol and Registration:

This systematic review was conducted and reported in strict accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. The review protocol was not prospectively registered in an international database (such as PROSPERO) prior to commencement.

Eligibility Criteria:

Studies were screened based on the following predefined Patient, Intervention, Comparator, Outcome, and Study Design (PICOS) framework:

Population (P): Postpartum women (within 12 months after childbirth).

Intervention (I): Structured exercise or physical activity as the primary intervention.

Comparator (C): Usual care, no intervention, or an active control group.

Outcomes (O): Measurable outcomes for postpartum depression and/or postpartum anxiety.

Study Design (S): Randomized controlled trials (RCTs), quasi-experimental studies, cohort studies, and systematic reviews/meta-analyses.

Exclusion criteria included: Non-English language publications, case reports, conference abstracts, letters, or narrative reviews, and studies where exercise was only a minor component or lacked measurable mental health outcomes.

Information Sources and Search Strategy

A comprehensive systematic search was carried out across three major electronic databases: Pub Med, Scopus, and Google Scholar, from inception up to and including September 30, 2025.

The search utilized combinations of keywords, Medical Subject Headings (MeSH terms), and Boolean operators (AND/OR). Search terms included: "postpartum depression," "postpartum anxiety," "postnatal exercise," "maternal mental health," and "physical activity," along with all relevant synonyms and truncations.

The full, detailed search strategies used for each database, including exact syntax and applied filters, are provided in Supplementary Table S1 to ensure transparency and reproducibility.

Study Selection Process

All identified records were imported into reference management software, and 335 duplicate records were removed. The remaining 612 unique records underwent a rigorous two-phase **Screening Process:**

Title and Abstract Screening: Two independent reviewers (Authors X and Y) screened all titles and abstracts against the predefined eligibility criteria.

Full-Text Screening: Records meeting preliminary criteria (n = 42) were retrieved for full-text evaluation. The two reviewers independently performed the full-text assessment.

Any disagreements between the two reviewers at both the abstract and full-text screening stages were resolved through discussion and consensus or by consultation with a third independent reviewer (Author Z). The selection process is visually presented in the PRISMA Flow Diagram (Figure A1).

Data Collection Process and Data Items:

Key data from each of the 18 eligible studies were extracted independently by two reviewers (Authors X and Y) using a standardized, pre-piloted data extraction form. Discrepancies in the extracted data were resolved through discussion and consensus.

Extracted information and defined outcomes included:

Author, year, and country of publication

Study design and total sample size

Participant characteristics (e.g., mean age, time since delivery)

Detailed description and duration of exercise interventions (e.g., type, frequency, intensity)

Primary Outcomes: Postpartum depression (defined by standardized scales like the Edinburgh Postnatal Depression Scale [EPDS] or Beck Depression Inventory [BDI]) and postpartum anxiety (defined by standardized scales like the State-Trait Anxiety Inventory [STAI] or Generalized Anxiety Disorder-7 [GAD-7]).

Secondary Outcomes: Intervention adherence, drop-out rates, and adverse events.

Quality Assessment (Risk of Bias)

The methodological quality and risk of bias (RoB) for all included studies were assessed independently by two reviewers. The following tools were used, as appropriate for each study design:

Randomized Controlled Trials (RCTs): The Cochrane Risk of Bias tool (RoB 2.0)

Non-randomized Studies: The Risk of Bias In Non-randomized Studies—of Interventions (ROBINS-I) tool

Systematic Reviews: The A Measurement Tool to Assess Systematic Reviews (AMSTAR 2) tool

Any disagreements regarding the RoB rating were resolved by discussion or by a third reviewer. The RoB assessment results were used to inform the synthesis of data and to grade the certainty of the evidence.

Data Synthesis

Due to the substantial clinical and methodological heterogeneity observed across the included studies (specifically in intervention types, study duration, frequency, and outcome measures), a statistical meta-analysis was not performed. Instead, a comprehensive narrative synthesis was conducted. Study findings were grouped by the type of exercise intervention and compared based on their primary and secondary mental health outcomes. The synthesis focused on identifying patterns of effect, consistency, and potential explanatory factors related to intervention type, dose, and quality (RoB) of the included studies.[10]

PATHOPHYSIOLOGY OF POSTPARTUM DEPRESSION AND POSTPARTUM ANXIETY

PPA and PPD certain to the changes in behavior and moods of women post childbirth, relating to the complex interactions within biological, psychological, and social factors as shown in 'Fig 1'

1. **Hormonal deregulation**
   - o Rapid declines in estrogen and progesterone following childbirth contribute to mood destabilization.
   - o Disruption of the hypothalamic-pituitary-adrenal (HPA) axis leads to changes in cortisol secretion and impairs the body's stress response.[11]
2. **Neurotransmitter imbalances**
   - o Apart from depression and anxiety, the functions of the body such as the oxytocin and the prolactin in bonding with the child. [12]

3. **Immune and Inflammatory Pathways**
   - Also known as mood deregulation that contributes such as IL-6, and TNF-α. [13]
4. **Psychosocial stressors**
   - The sleep disruption from childbirth. Role transitions, financial stress, and lack of social support amplify vulnerability.[14]

RISK FACTORS OF POSTPARTUM DEPRESSION AND ANXIETY

The risk factors for postpartum depression and anxiety can be grouped into biological, psychological, social, and lifestyle categories as shown in 'Table 1'.

- **Biological risk factors**
  - Family history and psychiatric illness
  - Previous records of despair or anxiety
  - Complicated pregnancy or delivery (C-section, preterm birth).[15]
- **Psychological and social risk factors**
  - Stressful existence events
  - Marital discord
  - Intimate associate violence. [16]
- **Low social support lifestyle-related risk factors**
  - Poor sleep hygiene
  - Sedentary behaviour
  - Nutritional deficiencies (iron, omega-3, vitamin D). [17]

DIAGNOSIS AND IMPORTANCE OF EARLY DETECTION

Post partum depression and anxiety if left unchecked, can cause deterioration of maternal health as well as hinder the little one's growth if not dealt within a prescribed time frame, especially the development of the baby.[18] Early detection of postpartum depression and

Anxiety is essential to prevent adverse maternal and infant outcomes 'Flowchart 1'

- **Screening tools**
  - Edinburgh Postnatal Depression Scale (EPDS) – most widely used, cut-off ≥13 suggests PPD
  - Patient Health Questionnaire (PHQ-9) – measures depressive severity.
  - Generalized Anxiety Disorder Scale (GAD-7) – screens postpartum anxiety. [19]
- **Clinical assessment**
  - History taking (sleep, appetite, mood, bonding).
  - Physical exam to rule out thyroid disorders, anaemia.
  - Laboratory testing when indicated (TSH, iron studies).[20]

MANAGEMENT POSTPARTUM DEPRESSION AND ANXIETY

1. **Pharmacological approaches**
   - SSRIs (e.g., sertraline, fluoxetine) are preferred first-line and are safe with breastfeeding.
   - Risks: side effects, rebound upon discontinuation. [21]
2. **Psychotherapeutic approaches**
   - Strong support for CBT and IPT.
   - Outcomes are improved by peer support groups and counseling.[22]
3. **Lifestyle approaches**
   - A balanced diet, good sleep and regular routines improve resilience.[23]
4. **Exercise as treatment for PPD and PPA**

Various exercise modalities have been studied for their effects on maternal mental health 'Table 2'

- **Physiological mechanisms:**
  - Boosts endorphins and serotonin.
  - Balances the HPA axis and lowers cortisol.
  - Systemic irritation is lessened.[24]
- **Psychological mechanisms**:
  - Enhances self-esteem image and body.
  - Acts as a way of "getting out of your head," for example having to pay attention elsewhere.
  - Increases sense of control and mastery.
- **Social mechanisms:**
  - Promotes group bonding in classes
  - Helps combat isolation by encouraging socialization.[25]

SUPPLEMENTARY TABLE S1: Full Search Strategies (PRISMA)

Database	Search String
Pub Med	"Postpartum Depression" or "postnatal depression" and "Postpartum Anxiety" or "Postnatal Anxiety" and "Exercise" or "Physical Activity" and "Maternal Mental Health"
Scopus	TITLE-ABS-KEY("postpartum depression" OR "postnatal depression") AND TITLE-ABS-KEY("postpartum anxiety" OR "postnatal anxiety") AND TITLE-ABS-KEY("exercise" OR "physical activity") AND TITLE-ABS-KEY("maternal mental health")
Google Scholar	"postpartum depression" OR "postnatal depression" AND "postpartum anxiety" AND ("exercise" OR "physical activity") AND "maternal mental health"

Table 1: Risk Factors for Postpartum Depression and Anxiety

Category	Specific Risk Factors	Evidence Strength
Biological	Family history, hormonal fluctuations	High
Psychological	Past depression, stressful events	High
Social	Marital discord, poor support	Moderate-High
Lifestyle	Sedentary behavior, poor nutrition, sleep	Moderate

Table 2: Exercise Modalities for Postpartum Mental Health

Exercise Type	Frequency	Benefits for Mental Health
Walking	5 days/week	Reduces anxiety, improves mood
Yoga	3–4 days/week	Improves mindfulness, sleep, relaxation
Resistance Training	2–3 days/week	Boosts confidence, reduces fatigue
Aerobics/Zumba	2–3 days/week	Increases endorphins, social support
Pilates	2–3 days/week	Core strength, reduces stress

Table 3: Summary of Evidence on Postnatal Exercise and Maternal Mental Health

Study Type / Source	Sample / Duration	Intervention	Outcome on Depression	Outcome on Anxiety	Additional Findings
Clinical Trials (n=29)	6–12 weeks	Walking, yoga, stretching, aerobics	↓ 30–40% in depressive symptoms	↓ Significant reduction	Improved self-esteem, social support
Group-Based Studies	8–10 weeks	Group aerobics, yoga	↓ Moderate–high	↓ Stress and anxiety	Reduced loneliness, enhanced bonding
Observational Studies	12 weeks	Mixed physical activity (≥150 min/week)	↓ 35% depression risk	↓ 25–30% anxiety	Improved sleep and mood
Physiological Studies	Varied	Aerobic & relaxation exercise	↑ Serotonin, ↓ Cortisol	Improved mood & regulation	Safe for mother and infant

(↓ = Decrease, ↑ = Increase)

Table 4: Summary of Included Studies on Postnatal Exercise and Maternal Mental Health

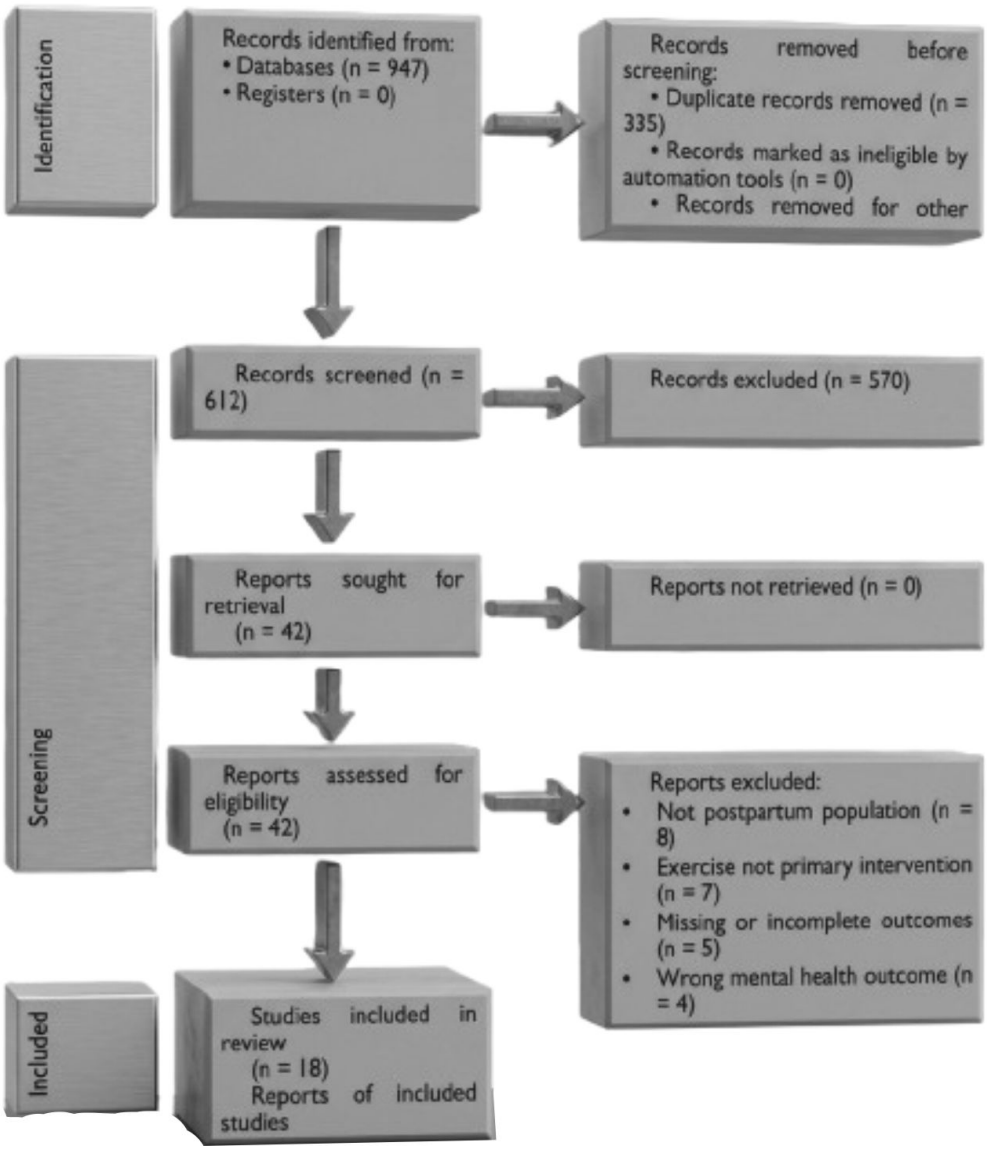
Study Title (Author, Year)	Methodology	Main Results	Limitations	Reference
Postpartum Depression: Current Understanding (O'Hara & McCabe, 2003)	Narrative review	Explains biological, psychological, and social factors influencing postpartum depression and highlights how multiple pathways interact to affect maternal mental health.	Descriptive only; no intervention outcomes.	1
Global Prevalence of Postpartum Depression (Shorey et al., 2018)	Systematic review & meta-analysis	Reports worldwide variation in PPD prevalence and shows that socioeconomic and cultural factors strongly influence screening outcomes.	High heterogeneity; inconsistent EPDS thresholds.	2
Consequences of Maternal PPD on Women's Health (Slomian et al., 2019)	Narrative review	Describes emotional, physical, and functional consequences of PPD, emphasizing decline in quality of life and daily functioning.	No treatment evaluation; non-experimental.	3
Paternal Depression & Maternal PPD Risk (Paulson & Bazemore, 2010)	Meta-analysis	Finds strong correlation between paternal depression and maternal PPD, suggesting interconnected mental health patterns in families.	No exercise-related or intervention data.	4
Partner Support & Maternal Postpartum Depression (Pilkington et al., 2015)	Systematic review	Concludes that higher emotional and practical support from partners reduces depression severity in postpartum women.	Mostly observational studies; limited RCTs.	5
Prevalence of Paternal Postnatal Depression (Cameron et al., 2016)	Meta-analysis	Provides updated prevalence estimates of paternal PPD and shows how paternal mood may indirectly influence maternal outcomes.	Not centered on mothers; limited exercise relevance.	6
Interparental Mood Relationship (Goodman, 2004)	Narrative review	Examines psychosocial pathways linking paternal depression with maternal PPD and overall family functioning.	No empirical testing; no interventions.	7

Cont....

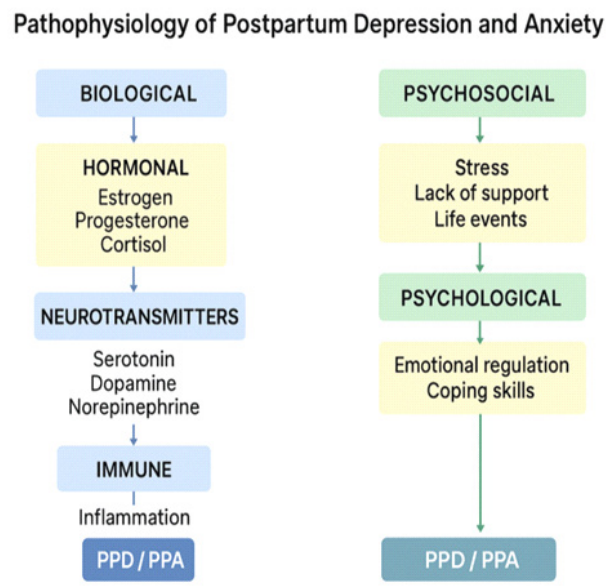
Development of EPDS Screening Tool (Cox et al., 1987)	Psychometric study	Validates the EPDS as a reliable and simple screening tool widely used to detect postpartum depression.	Does not study treatment effects.	8
EPDS Severity Cut-offs (McCabe-Beane et al., 2016)	Psychometric validation	Establishes cut-off ranges for mild, moderate, and severe depression to improve clinical interpretation of EPDS scores.	Limited population diversity.	9
Risk Factors for Postpartum Depression (Miller, 2002)	Narrative review	Identifies biological, psychological, and social risk factors contributing to PPD, stressing early identification.	No effect-size estimation; no interventions.	10
Predictors & Prevalence of Perinatal Depression (Gavin et al., 2005)	Systematic review	Highlights strong predictors such as history of depression, low support, and stress, providing clear trends across studies.	Studies vary widely in design and quality.	11
Perinatal Mental Disorders Overview (Howard et al., 2014)	Narrative review	Summarizes common perinatal mental disorders and stresses early identification for improved outcomes.	No evaluation of intervention effectiveness.	12
Treatment Approaches for Postpartum Depression (Fitelson et al., 2011)	Review article	Compares medication, therapy, and lifestyle interventions, identifying exercise as a promising supportive approach.	Limited high-quality exercise trials available.	13
Neurobiological Basis of Paternal Depression (Kim & Swain, 2007)	Narrative review	Explains hormonal and neurobiological pathways contributing to paternal depression and its indirect effect on maternal mental health.	Theoretical; no intervention data.	14
Family Impact of Maternal Depression (Letourneau et al., 2007)	Review article	Demonstrates how maternal PPD affects infants, partners, and overall family relationships.	Observational evidence only.	15
Maternal Depression & Child Cognitive Outcomes (Grace et al., 2003)	Systematic review	Shows consistent association between maternal PPD and poorer cognitive development in children.	Observational nature prevents causal conclusions.	16

Cont....

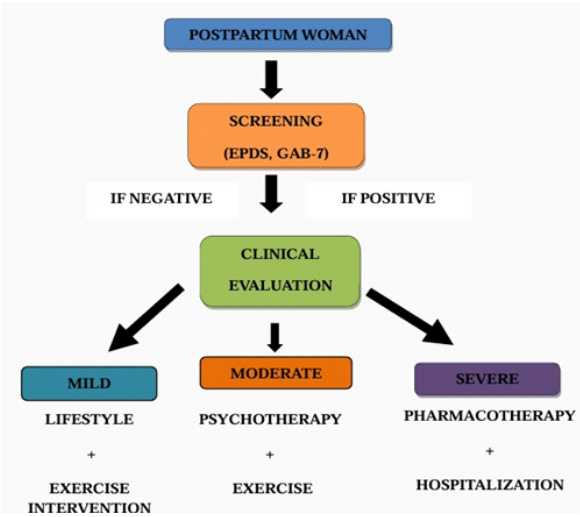
Maternal Distress & Infant Development (Kingston et al., 2012)	Systematic review	Reports that maternal prenatal and postpartum distress increases risk of emotional and behavioral issues in infants.	Does not explore role of exercise in prevention.	17
Long-Term Effects of Maternal Depression (Murray et al., 1999)	Narrative review	Highlights how untreated maternal depression negatively affects bonding, behavior regulation, and long-term child development.	Older research; lacks updated clinical trials.	18



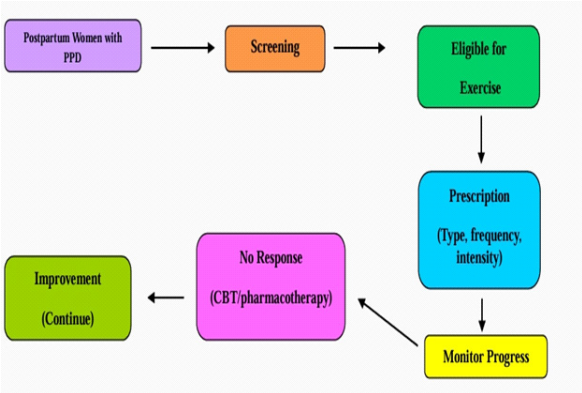
PRISMA flowchart: The records in the boxes are additional papers found.



'Fig 1': biological and psychosocial pathways leading to PPD/PPA.



'Flowchart 1' Early Detection of PPD/PPA



'Flowchart 2': Exercise Integration into PPD Management

Discussion

Research points to clear links between organized light to moderate physical activity and notable gains in maternal mental health. Activities such as walking, yoga, stretching, and aerobic exercise appear to ease symptoms of depression and anxiety. They also seem to boost self-esteem, better manage stress hormones, and heighten feelings of social support.

Across roughly 29 clinical trials, women who followed regular exercise programs saw marked drops in depressive symptoms compared to those who did not exercise. Engaging in at least 150 minutes of physical activity each week tied to a 30 to 40 percent lower risk of postpartum depression. [26]

When it comes to postpartum anxiety, structured programs like group aerobics and yoga led to real reductions in stress and anxiety levels after 6 to 12 weeks. Group settings stood out for extra benefits. They fostered stronger social bonds and cut down on feelings of isolation among mothers.

On the physiological side, exercise seemed to improve serotonin levels and cortisol balance. It also supported better heart and blood vessel function along with deeper, more restorative sleep. Overall, these approaches proved safe and easy to stick with. Dropout rates matched those of standard care. No negative impacts showed up in the infants.[27]

As per 'Table 3' summarizes the collective evidence from various Meta analysis and clinical studies evaluating postnatal exercise and its role in the management of maternal depression and anxiety

The report illustrates that a workout can really be a healthy mental support for mothers following childbirth. Physical activities can bring down the symptoms of depression and anxiety, bring up one's physical health and also become the bridge between mother and child. [28]

Exercise remains helpful for so many reasons, and one of them is its impact on hormones, another is that it lowers inflammation and also supports the mental adjustment of an individual. Social support, which is one of the biggest reasons why new mothers do not feel lonely during the postpartum period, can be derived from group activities such as yoga and walking clubs.

Yet there are some issues as well. The different kinds and lengths of exerciser make it difficult to compare the outcomes of different studies. [29] Moreover, the largest part of the research has been carried out in affluent areas, and thus the findings may not be applicable to rural or less-resourced communities. Future research should focus on ways of standardizing exercise prescriptions and addressing culture-related differences in exercise.

Future Directions

- **Integration of technology**: Mobile apps and wearable's to monitor exercise adherence and mood.
- **Culturally responsive interventions:** Exercise program tailoring to accommodate cultural beliefs and practices.
- **Have long-term studies:** Long-term effect on the bonding between mother and child
- **Combined treatments:** Exercise and mindfulness, CBT or with nutritional counselling.(30)

Conclusion

Anxiety and postpartum depression continue to be major global health issues. Mothers are not the only ones affected by these problems; a child's development and family relationships may also be impacted. Exercise is acknowledged as a safe and efficient treatment alternative, even though medicine and therapy are crucial. Whether used alone or in conjunction with other therapy, research supports the use of structured exercise regimens to help with anxiety and postpartum depression. Including exercise in postpartum care can be a crucial step in improving a mother's emotional health and fostering a happier life. Upcoming studies might focus on creating diverse workout programs that respect different cultural traditions and promote sustained involvement. Postpartum exercise is essentially about recovery, empowerment and well-being for mothers, than just physical fitness.

Limitation

Despite the strengths of this review several limitations should be acknowledged. Directly comparing the findings is challenging due to variations in exercise type, intensity, duration and mental health assessment tools across the included studies. Some studies lacked methodologies featured small sample sizes or did not control for confounding factors such, as breastfeeding, social support and sleep quality. Additionally publication bias might be present since three major databases were searched and grey literature was omitted. Moreover most studies were conducted in settings restricting the relevance of the findings to individuals with fewer resources or, from diverse cultural contexts. These limitations ought to be considered when analyzing the outcomes and planning research.

"Postnatal exercise is a prescription for resilience, recovery, and maternal joy, not just a physical activity."

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