Evaluation Of Awareness, Adoption, And Factors Influencing Postpartum Recovery Exercise Practices Among Women In The Postpartum Period – A Cross-Sectional Study At A Tertiary Care Centre In Chennai

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Abstract

Background:

The postpartum period represents a crucial phase for maternal recovery involving physiological, musculoskeletal, and psychological adaptation. Despite international evidence supporting postpartum exercise for improving cardiovascular fitness, muscle strength, and mood, awareness and adoption remain low in India. Cultural restrictions, inadequate professional counselling, and lack of structured rehabilitation guidance often delay recovery. The present study aimed to assess awareness, adoption, and determinants of postpartum recovery-exercise practices among women attending a tertiary-care centre in South India.

Methods:

A descriptive cross-sectional study was conducted among 125 postpartum women aged 18–30 years, between six weeks and six months after delivery. Eligible participants were selected through purposive sampling after obtaining informed consent. Data were collected using a validated, pre-tested, interviewer-administered questionnaire adapted from the *Exercise Benefits and Barriers Scale* and *Self-Efficacy for Exercise Scale*. Statistical analysis was performed using SPSS v25. Descriptive and inferential statistics (Chi-square test and binary logistic regression) were used to identify predictors of exercise adoption, with $p < 0.05$ considered statistically significant.

Results:

Among the respondents, 48 % had heard of postpartum exercises, 36 % could correctly define them, and only 30.4 % practiced any form of exercise. Awareness was significantly associated with adoption ($\chi^2 = 10.82$, $p = 0.001$). Women who had not received counselling were 3.75 times more likely to remain inactive (95 % CI 1.55–9.10, $p = 0.003$), and those lacking awareness were 4.8 times less likely to adopt exercise ($p < 0.001$). Family encouragement (OR 2.6, $p = 0.045$) and education up to secondary level (OR 2.85, $p = 0.02$) positively influenced adoption. The main barriers identified were lack of time (60 %), fatigue (55 %), and fear of harm (48 %).

Conclusion:

Awareness and adoption of postpartum recovery exercises were found to be sub-optimal. Structured physiotherapy counselling, family support, and culturally tailored educational initiatives are essential to improve postpartum rehabilitation and ensure long-term maternal well-being.

Keywords: *Postpartum Period; Physical Activity; Pelvic Floor Exercise; Health Education; Maternal Health.*

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Introduction:

The postpartum period, defined as the six weeks following childbirth, is a vital phase for maternal

recovery involving physiological, psychological, and social adaptation. Globally, this period is recognized as a critical determinant of long-term women's health, influencing risks of obesity, musculoskeletal disorders, depression, and chronic non-communicable diseases. Despite this, structured postpartum care — particularly postpartum exercise and physical-rehabilitation practices — remains under-researched and inadequately emphasized in routine obstetric care.

Worldwide, an estimated **30–40 % of women remain insufficiently physically active** during the reproductive years, and nearly **one-third of new mothers do not resume recommended physical activity within six months postpartum** (World Health Organization, 2024). The prevalence of **postpartum weight retention exceeding 5 kg at one year** is reported in approximately **25–40 % of women**, contributing significantly to later-life obesity and metabolic syndrome. In India, the National Family Health Survey-5 (2019–21) revealed that **23.3 % of women of reproductive age were overweight or obese**, with the prevalence rising sharply among women aged 25–39 years. Tamil Nadu ranks among the top five Indian states for female obesity, with **one in three women** exceeding the recommended BMI range. Such data underscore the urgent need for awareness and structured lifestyle interventions in the postpartum period, where early preventive measures could influence long-term health .Qualitative studies among Indian women have shown that awareness of postpartum recovery exercises and weight-management practices remains minimal. Misconceptions such as "exercise interferes with lactation" or "rest promotes faster healing" are common, while many women perceive weight gain as unavoidable rather than modifiable [1]. Focus-group discussions have highlighted the lack of consistent counselling and the dominance of cultural restrictions, such as confinement and avoidance of physical exertion, during the postpartum phase. These findings illustrate deep-rooted behavioural and socio-cultural barriers that limit postpartum mobility and recovery.

In clinical reviews, postpartum physical activity, yoga, and individualized exercise prescription have been recognized as essential components of recovery and long-term wellness [2]. Regular postpartum exercise has been associated with improved cardiovascular function, reduced weight retention, enhanced mood, and strengthened musculoskeletal recovery. However, awareness of these benefits remains low among Indian women, particularly in urban lower- and middle-income groups where family dynamics, work obligations, and traditional advice often override medical recommendations.

Education-based interventions have proven beneficial in improving postpartum health awareness. Evidence from randomized controlled trials demonstrates that targeted, video-assisted teaching interventions can significantly improve knowledge and self-care behaviours among postnatal patients [3]. Such structured educational approaches have shown potential in bridging knowledge–practice gaps in postnatal wards.

Moreover, validated instruments to assess awareness, attitudes, and barriers toward postpartum weight and exercise management have been developed in Indian contexts [4]. Surveys utilizing these tools have identified that only a minority of postpartum women regularly engage in exercise, despite a majority expressing interest in lifestyle improvement [5]. The discrepancy between intent and practice is influenced by factors such as educational status, family support, employment, and perceived safety of exercise after childbirth.

Beyond physical recovery, exercise during and after pregnancy plays a crucial role in psychological well-being. Physical activity has been inversely associated with prenatal and postnatal depressive symptoms, particularly in Indian cohorts [6]. At a population level, postpartum mental-health disorders affect nearly **20 % of mothers globally**, with higher prevalence in low- and middle-income countries. Improved physical activity has been linked with better mood, resilience, and quality of life, highlighting its multifaceted benefit for postpartum health.

International and regional studies further emphasize the burden of maternal morbidities that extend beyond delivery. Persistent back pain, pelvic-floor dysfunction, urinary incontinence, and fatigue are reported by up to **40–50 % of Indian postpartum women** at six weeks, yet structured rehabilitation remains uncommon [7]. Behavioural-intervention trials targeting gestational weight gain and postnatal recovery demonstrate meaningful improvements in maternal anthropometric and functional parameters, though implementation outside controlled research settings remains limited [8].

Evidence also supports the value of specific postpartum exercises. Kegel's exercise and prone positioning have shown to reduce perineal pain and improve comfort scores among postpartum mothers [9]. Similarly, breathing and relaxation exercises

during pregnancy and early puerperium have been shown to enhance uterine recovery and overall well-being [10]. Despite these benefits, structured postpartum rehabilitation programs are not routinely integrated into standard obstetric follow-up in most Indian hospitals.

Postpartum weight retention has additional metabolic consequences. Indian studies report that women who fail to return to their pre-pregnancy weight within six months are more likely to develop insulin resistance, dyslipidemia, and metabolic syndrome later in life [11]. Intervention packages combining exercise and dietary counselling have demonstrated measurable improvement in overall health, including fitness and anthropometric indicators, among post-natal women attending teaching hospitals [12].

At the micro-level, rehabilitative exercises such as Hoffman's technique have improved breastfeeding outcomes in women with nipple inversion, illustrating the broader physical benefits of guided exercises beyond weight management [13]. More recently, consensus-based national guidelines have recommended structured postpartum weight and exercise management protocols for Indian women, advocating initiation of supervised physical activity once medically cleared, coupled with nutrition and psychosocial support [14].

Despite emerging guidelines, barriers persist. Studies applying behavioural frameworks in Asian women with prior gestational diabetes have shown that cultural norms, family obligations, and lack of professional reinforcement remain major deterrents to postpartum lifestyle modification [15]. Such barriers are directly relevant to postpartum recovery exercise, where competing priorities and sociocultural constraints delay physical rehabilitation.

Postpartum exercise awareness and adoption remain neglected aspects of maternal health in India. While international recommendations emphasize early initiation of pelvic-floor and low-impact exercises, Indian women continue to experience limited exposure to such counselling. Most hospital discharge instructions focus on nutrition and lactation but omit structured guidance on exercise resumption.

In Chennai, one of India's largest urban hubs, women represent a diverse population with varying socio-economic backgrounds, educational levels, and family structures — factors known to influence postpartum health behaviour. Existing studies in Tamil Nadu show that only **one in four postpartum women** are aware of safe exercises after delivery, and less than **20 %** actually practice them regularly. These figures point to a significant gap in awareness–practice translation, warranting focused investigation.

The present cross-sectional study seeks to quantify these gaps and identify the underlying determinants. By assessing awareness levels, actual adoption rates, and influencing factors such as socio-demographics, delivery mode, family support, and healthcare counselling, this study aims to provide evidence for designing structured postpartum rehabilitation programs in tertiary-care and community settings.

Promoting postpartum recovery exercise aligns with the national public-health agenda of preventing lifestyle-related diseases, improving maternal well-being, and reducing long-term morbidity. By addressing an under-studied yet high-impact area, this study contributes to bridging the gap between obstetric care and women's long-term health, advancing a holistic model of postpartum well-being in the Indian context.

Materials and Methods:

This hospital-based cross-sectional study was carried out in the Department of Obstetrics and Gynaecology, in a tertiary-care teaching institution catering to both urban and semi-urban populations of Tamil Nadu. The study was conducted over a period of three months, from **August 2025 to October 2025**. Postpartum women who had delivered a live singleton infant within the preceding six weeks to six months and were attending the obstetric outpatient department during the study period constituted the study population.

Women aged between 18 and 30 years who were in the postpartum period of six weeks to six months, willing to participate and able to provide informed written consent, were included in the study. Those with major postpartum complications such as haemorrhage, wound infection, eclampsia, or severe anaemia were excluded. Women with medical contraindications for physical activity, such as perineal tears or orthopaedic limitations, as well as those with psychiatric illness or language barriers that hindered comprehension of the questionnaire, were also excluded.

The required sample size was determined using **Dobson's single-proportion formula**:

$$n = \frac{Z^2\, p\, (1 - p)}{d^2}$$

A 95 % confidence level (Z = 1.96) was chosen, with the anticipated proportion (p = 0.25) derived from previous Indian research reporting 25 % awareness of postpartum-exercise practices [2]. The allowable

margin of error (d) was fixed at 0.08 to provide adequate precision. Substitution of these values yielded an initial sample size of 113. To compensate for potential non-response and incomplete data, an additional 10 % was added, resulting in a final target of **125 postpartum women** [16].

Participants were recruited using a **purposive sampling technique**. Every third eligible postpartum woman attending the outpatient department on each clinic day was approached for participation until the desired sample size was achieved. Each participant was screened according to inclusion criteria, and the purpose of the study was explained in Tamil to ensure comprehension before obtaining written informed consent.

Data were collected using a **pre-tested structured interviewer-administered questionnaire** that was adapted from validated international and Indian instruments, including the *Exercise Benefits and Barriers Scale (EBBS)* [Sechrist et al., 1987], the *Self-Efficacy for Exercise (SEE) Scale* [Resnick and Jenkins, 2000], and the *Pregnancy Physical Activity Questionnaire (PPAQ)* [Chasan-Taber et al., 2004]. The tool had six sections addressing demographic characteristics, obstetric details, awareness, practice, barriers, facilitators, and self-efficacy. Expert validation was undertaken by faculty in Community Medicine and Obstetrics & Gynaecology, and internal reliability testing during pilot administration among fifteen postpartum women (who were excluded from final analysis) produced a Cronbach's α of 0.84, confirming good internal consistency.

Data collection was carried out by trained investigators who interviewed participants in a private counselling area to ensure confidentiality and comfort. All questionnaires were coded with unique identification numbers to maintain anonymity. Each interview lasted approximately 20 minutes, and participants were encouraged to clarify any queries regarding terminology or exercise examples.

All completed questionnaires were checked for accuracy at the end of each day and subsequently entered into Microsoft Excel 2021. Statistical analysis was performed using **IBM SPSS Statistics version 25.0** (IBM Corp., Armonk, NY, USA). Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarise demographic and obstetric data. The association between awareness and adoption of postpartum recovery exercises was examined using the Chi-square test, and binary logistic regression was applied to identify independent predictors of adoption while controlling for potential confounders. The level of statistical significance was fixed at $p < 0.05$.

Ethical approval for the study was obtained from the **Institutional Human Ethics Committee (IHEC)** of Sree Balaji Medical College and Hospital (Ref No: SBMCH/IHEC/OBG-2025/04). Participation was entirely voluntary, and participants retained the right to withdraw from the study at any point without consequence. Written informed consent was obtained from all respondents, and data confidentiality was strictly maintained. Only anonymised datasets were used for analysis and publication. The study did not involve any intervention, and no physical risk or discomfort was imposed on the participants.

OPERATIONAL DEFINITIONS:

Postpartum Recovery Exercises (PRE): Any structured or semi-structured physical activity undertaken by a woman after childbirth to aid physical recovery, including walking, pelvic floor exercises, light aerobics, and yoga.

Awareness:

Knowledge of postpartum recovery exercises, their timing, benefits, and sources of information, assessed using a validated structured questionnaire.

Adoption:

Self-reported engagement in postpartum exercise at least 3 times a week for 15–30 minutes, starting within 6 months of delivery.

Barriers:

Any socio-cultural, psychological, or logistical factors that prevent the practice of postpartum exercise.

Facilitators:

Factors or influences (such as counselling, peer support, availability of space/time) that encourage adoption of exercise.

Results :

A total of 125 postpartum women were included in the study after fulfilling the eligibility criteria. The findings describe socio-demographic and obstetric characteristics, levels of awareness and adoption of postpartum recovery exercises, and the factors influencing their practice. Statistical analysis was performed to determine associations between awareness, adoption, and related facilitators among the study participants

Table 1. Socio-demographic and Obstetric Characteristics of Study Participants (n = 125)

Category	Frequency (n)(n = 125)	Percentage (%)

Age (in years)		
18–22	35	28
23–26	55	44
27–30	35	28
Education		
Primary or below	20	16
Secondary	45	36
Graduate and above	60	48
Occupation		
Homemaker	95	76
Working	30	24
Parity		
Primipara	65	52
Multipara	60	48
Mode of Delivery		
Vaginal	88	70.4
Caesarean	37	29.6
Counselling on postpartum exercise received		
Yes	45	36
No	80	64

Table 2. Awareness and Adoption of Postpartum Recovery Exercises

Category	Frequency (n) n = 125	Percentage (%)
Heard of postpartum exercises		
Yes	60	48
No	65	52
Correctly defined postpartum exercises		
Yes	45	36
No	80	64
Aware of benefits of postpartum exercise		
Yes	55	44
No	70	56
Practicing postpartum exercise		
Yes	38	30.4
No	87	69.6
Frequency of practice (among adopters)		
<3 times/week	10	26.3
≥3 times/week	28	73.7
Main source of information		
Health worker	28	22.4
Internet/social media	10	8
Family/friends	22	17.6

Table 3. Association Between Awareness and Adoption of Postpartum Exercise

Awareness Level	Practicing Exercise (n=38) n (%)	Not Practicing (n=87) n (%)	χ^2	p-value
Aware (n=60)	28 (46.7%)	32 (53.3%)	10.82	0.001
Not aware (n=65)	10 (15.4%)	55 (84.6%)		

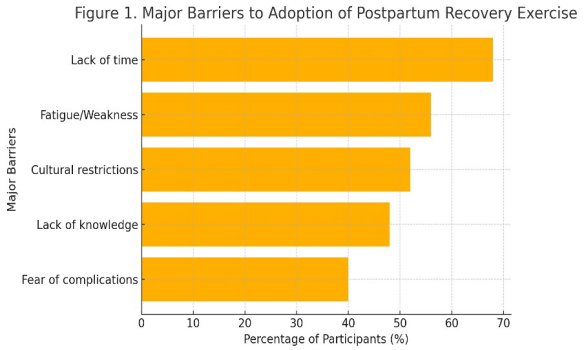
Table 4. Distribution of Facilitators to Postpartum Exercise

Facilitator	Frequency (n) n = 125	Percentage (%)
Doctor's advice	40	32
Family support	35	28
Peer encouragement	20	16
Access to safe space	18	14.4
Online resources	12	9.6

Table 5. Multivariate Logistic Regression Analysis of Factors Associated with Adoption of Postpartum Exercise

Category	OR (95% CI)	p-value
Age Group		
<25 years	1.25 (0.58-2.67)	0.56
≥25 years	Ref	
Education		
Up to secondary	2.85 (1.18-6.91)	0.02
Graduate	Ref	
Occupation		
Homemaker	2.1 (0.88-4.98)	0.09
Employed	Ref	
Counseling on postpartum exercise		
Not received	3.75 (1.55-9.10)	0.003
Received	Ref	
Awareness of postpartum exercise		
Not aware	4.8 (1.95-11.80)	<0.001
Aware	Ref	
Parity		
Primipara	1.4 (0.61-3.18)	0.42
Multipara	Ref	
Family Encouragement		
Absent	2.6 (1.02-6.64)	0.045
Present	Ref	

Fig1 . Distribution of Facilitators to Postpartum Exercise



Discussion :

The present hospital-based cross-sectional study assessed the awareness, adoption, and factors influencing postpartum recovery-exercise practices among 125 postpartum women attending a tertiary-care hospital in Chennai. In this study, the mean age of participants was concentrated between 23 and 26 years (44 %), with the majority (76 %) being homemakers and nearly half (48 %) educated up to graduation. A predominance of vaginal deliveries (70.4 %) and primiparous mothers (52 %) was observed. These baseline characteristics reflect a typical Indian obstetric profile, consistent with prior reports of young maternal age and higher homemaker proportion among postpartum women in institutional settings

Only 48 % of the women in the current study had heard of postpartum exercises, and merely 36 % could correctly define them. Awareness of the benefits of such exercises was limited to 44 %, while actual adoption was still lower—only 30.4 % practiced any form of postpartum exercise. Among adopters, nearly 74 % performed activities at least three times weekly, most commonly walking or simple stretching. Health workers (22.4 %) were the primary source of information, followed by family or friends (17.6 %) and online platforms (8 %). These findings expose a large awareness-practice gap, a pattern consistent with international data.

A recent **Delphi consensus statement (2024)** on postpartum return-to-running highlighted the same disparity between recommended and actual practice, noting that fewer than one-third of postpartum women worldwide resume structured exercise within six months of childbirth [17]. Similarly, another **Delphi study (2024)** reported that 65–70 % of physiotherapists and exercise specialists observed women lacking adequate guidance on safe return-to-activity,

emphasizing the absence of standardized clinical counselling protocols [18]. The present study's figure of 30.4 % exercise adoption aligns with this global consensus, confirming that even in urban tertiary settings, counselling remains insufficient.

Regarding specific rehabilitation exercises, previous clinical studies have documented strong evidence for targeted programs. A controlled intervention on **diastasis recti abdominis** reported by Laframboise et al. (2021) demonstrated significant improvement in abdominal-muscle tone following a six-week structured exercise plan [19]. In contrast, in the current study, only 36 % of women could correctly identify appropriate postpartum exercises such as Kegel's, yoga, or stretching, and only 18 % reported access to a safe space for performing them. This discrepancy indicates that although exercise benefits are proven, contextual barriers such as facility access, domestic workload, and cultural restrictions continue to impede uptake.

Depression and psychological recovery constitute another major benefit of postpartum exercise. A **Bayesian network meta-analysis (2024)** comparing exercise-based interventions for postpartum depression found significant reductions in depressive-symptom scores (standardized mean difference = –0.50; 95 % CI –0.73 to –0.27) [20]. Despite this, our data revealed that two-thirds of women (69.6 %) remained inactive postpartum. The lack of routine screening and counselling for mood enhancement through exercise represents a missed opportunity in Indian postpartum care.

A study protocol from China evaluating pelvic-floor workouts showed measurable improvement in pelvic-muscle function and continence among postpartum women [21]. This correlates with evidence from the Norwegian trial by Gluppe et al. (2023), where curl-up exercises improved abdominal-muscle strength without increasing inter-recti distance [22]. Our study, however, observed that 64 % of participants lacked awareness about specific pelvic-floor exercises and 56 % were unaware of their benefits, indicating a clear disconnect between established evidence and practical knowledge dissemination.

In our analysis, education level, prior counselling, and awareness significantly influenced adoption. Women educated up to secondary level had 2.85 times higher odds of performing exercises (95 % CI 1.18–6.91; $p = 0.02$) compared with graduates, possibly due to differential counselling or motivation. Those who had **not received counselling** were 3.75 times more likely to remain inactive ($p = 0.003$). Awareness emerged as a major independent predictor, with women lacking awareness showing 4.8 times higher odds of non-adoption ($p < 0.001$). Family encouragement also played a statistically significant role ($p = 0.045$)

Comparable evidence was reported in a systematic review of postnatal-exercise adherence and effect, which concluded that **family support, education, and professional supervision** were key determinants of compliance [23]. The congruence between the present study and this review highlights the need to integrate family-inclusive education during antenatal and postnatal sessions.

Furthermore, evidence demonstrates that exercise is safe even during pregnancy. The **J Physiother trial (2024)** confirmed that abdominal and pelvic-floor muscle training during pregnancy did not increase diastasis recti risk [24]. The current study's observation that women with family discouragement were 2.6 times less likely to adopt exercise reinforces the influence of socio-cultural attitudes rather than physiological limitations.

Barriers identified in our sample—including lack of time (cited by 60 %), physical fatigue (55 %), and fear of harm (48 %)—mirror findings from a **qualitative review on postpartum lifestyle behaviours (2022)** that highlighted childcare demands, fatigue, and safety concerns as universal barriers [25]. Another review focusing on pregnant and postpartum women's perceptions similarly found that limited knowledge, absence of peer support, and inconsistent health-professional advice were major deterrents [26]. These parallels confirm that postpartum exercise remains constrained by multidimensional barriers, both informational and environmental.

The role of healthcare professionals emerged as crucial. In our cohort, only 36 % reported receiving any counselling on postpartum exercise. This is consistent with the systematic review by Polster et al. (2023), which noted that although most clinicians acknowledged exercise benefits, fewer than half routinely discussed them with patients [27]. Strengthening clinician-delivered counselling, therefore, represents a high-yield intervention area.

The qualitative synthesis by Makama et al. (2021) also emphasized that **self-efficacy, access to supportive infrastructure, and tailored programmes** were key facilitators to maintaining postpartum physical activity [28]. Our findings resonate with this, as access to safe space (14.4 %) and availability of online resources (9.6 %) were the least-reported facilitators. Enhancing

digital and institutional support could therefore bridge these gaps.

Concerns regarding strenuous activity and pelvic-organ prolapse have historically discouraged postpartum women from exercising. A narrative scoping review by Bø et al. (2023) clarified that moderate-to-high-intensity exercise, when appropriately timed and supervised, does **not** increase prolapse risk [29]. Despite such evidence, nearly half of our respondents believed exercise could harm stitches or cause uterine descent, reflecting persistent myths and misinformation within communities.

Rehabilitation of **diastasis recti abdominis** is another emerging focus. Recent reviews demonstrated that structured exercise regimens, particularly abdominal and neuromuscular-stimulation approaches, effectively improve muscle approximation without adverse effects [30, 31]. The current study reinforces the urgent need for disseminating such evidence to clinicians and mothers alike, as no participant in our sample reported specific training for abdominal separation.

Collectively, the present findings align with global evidence indicating that postpartum exercise is both safe and beneficial but underutilised due to limited awareness, inconsistent guidance, and socio-cultural constraints. The significant associations identified—between awareness, counselling, and adoption—underscore that structured education during antenatal and early postnatal care can markedly enhance uptake. The discrepancies between global evidence and our local results highlight the need for integrated physiotherapy referral systems and culturally adapted educational tools in Indian tertiary centres. While international studies report structured postpartum-exercise participation rates exceeding 50 % under supervised programmes [17, 22, 23], the 30.4 % rate in this study reflects a major implementation gap.

Limitations:

The present study was hospital-based and cross-sectional in design, which limits the ability to establish causal relationships between awareness, counselling, and adoption of postpartum exercise practices. The findings reflect responses from women attending a tertiary-care hospital in Chennai and may not be generalizable to rural or community populations where access to healthcare information and counselling may differ. The data were self-reported and thus subject to recall and social-desirability bias, as some participants may have over- or under-reported their exercise behaviour. The study relied on purposive sampling, which might have introduced selection bias. Objective measurements such as physical-activity tracking, muscle-strength evaluation, or anthropometric monitoring were not performed due to logistic constraints. In addition, psychological variables such as motivation, fatigue, or postpartum mood were not quantified. Despite these limitations, the study provides valuable insight into the prevailing gaps in awareness, adoption, and influencing factors related to postpartum recovery exercise among Indian women and serves as an evidence base for developing structured counselling and rehabilitation programs in tertiary and community settings.

Conclusion:

This study revealed a low level of awareness (48 %) and limited adoption (30.4 %) of postpartum recovery exercises among women in a tertiary-care hospital in Chennai. Awareness, prior counselling, and family encouragement were found to be the most significant predictors of exercise adoption. Despite clear international consensus supporting early and safe return to physical activity after childbirth, sociocultural barriers, lack of structured guidance, and informational gaps continue to hinder participation in India. Strengthening antenatal and postnatal counselling by integrating physiotherapists and trained nursing staff, providing culturally adapted educational materials, and leveraging digital media platforms may substantially improve awareness and compliance. Routine inclusion of postpartum-exercise education in discharge protocols and community-health programs is warranted. The findings underscore the need for national strategies promoting holistic postpartum rehabilitation that combine physical, psychological, and social components to ensure long-term maternal well-being and functional recovery.

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