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## The Impact of Physical Activity During Normal-Risk Pregnancy on Labor and Delivery Outcomes: The Role of Family and Community Medicine in Prenatal Care – An Integrative Review

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### Abstract

**Objective:** To investigate scientific evidence in the literature regarding the impact of regular physical activity during a normal-risk pregnancy on the progression of labor, taking into account the type, frequency, and intensity of the exercises performed.

**Methodology:** A systematic literature review was conducted in the PubMed, CAPES Journal Portal, and Virtual Health Library (VHL) databases, including studies published between 2016 and 2026 in Portuguese, English, and Spanish. The selection of studies followed the stages of identification, screening, eligibility, and inclusion, in accordance with the PRISMA 2020 guidelines. After applying the inclusion and exclusion criteria and reviewing titles, abstracts, and full-text articles, 38 articles were included in the final analysis.

**Results:** The analyzed studies indicate that regular physical activity during pregnancy is associated with a higher prevalence of vaginal delivery, a possible reduction in the duration of labor, and a lower need for obstetric interventions, such as epidural analgesia and cesarean section. No evidence was found of an increased risk of vaginal laceration or adverse events related to exercise, even at moderate to controlled intensities.

**Conclusion:** Regular physical activity during a low-risk pregnancy is safe and potentially beneficial for the progression of labor, contributing to more favorable obstetric outcomes. The systematic incorporation of exercise guidance into prenatal care, in an individualized and supervised manner, is recommended as a strategy for promoting maternal and neonatal health.

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**Keywords:** Pregnancy, Physical Activity, Labor, Childbirth, Maternal Health

### 1. Introduction

Uncomplicated pregnancies are characterized by the absence of clinical or obstetric conditions that increase maternal or fetal risk, allowing prenatal care and the progression of labor to follow an expected physiological course (MONTENEGRO; REZENDE FILHO, 2017; ZUGAIB, 2020) <sup>[27, 54]</sup>. The delineation of this group is justified by the need to minimize potential

confounding factors, enabling a more accurate analysis of the isolated effects of physical activity on the progression of labor.

In this context, international and national recommendations highlight physical activity as a safe and beneficial strategy during low-risk pregnancies, provided there are no specific contraindications (WHO, 2024; FEBRASGO, [n.d.]) [34, 14].

Robust scientific evidence demonstrates that regular physical activity throughout pregnancy is associated with improved maternal fitness, reduced incidence of complications such as gestational diabetes mellitus and excessive weight gain, and significant benefits to quality of life (DAVENPORT *et al.*, 2018; RUCHAT *et al.*, 2018) [8, 38].

In addition, systematic reviews and international guidelines suggest that physical activity may have a positive influence on obstetric outcomes, including higher rates of vaginal delivery and a reduced need for interventions during labor, without increasing the risk of adverse maternal or fetal events (MOTOLA *et al.*, 2018; DI PIETRO *et al.*, 2019) [28, 12]. These findings reinforce the importance of incorporating active habits as part of prenatal care.

From a physiological perspective, the progression of labor depends on the interaction between uterine contractility, the conditions of the birth canal, and maternal expulsive force, the latter being directly influenced by the pregnant woman's functional capacity. Thus, better physical fitness can facilitate the coordination of expulsive efforts, increase pain tolerance, and contribute to a more efficient progression of labor (MONTENEGRO; REZENDE FILHO, 2017) [27].

However, despite the available evidence, gaps remain regarding the magnitude of the impact of physical activity on specific labor outcomes. The heterogeneity of exercise protocols, as well as the variability of the outcomes analyzed in the studies, makes it difficult to establish more precise and standardized clinical recommendations.

Given this scenario, it is important to further investigate the influence of physical activity during a normal-risk pregnancy on the progression of labor. Thus, the present study aims to analyze, in light of the scientific literature, the impact of regular physical activity on the dynamics of labor and delivery, considering variables such as the type, frequency, and intensity of the exercises performed.

## 2. Justification

The conduct of this study is justified by the persistence of gaps in the scientific literature regarding the effects of physical activity on the progression of labor and delivery in low-risk pregnancies, since, despite advances in evidence, considerable heterogeneity is observed in intervention protocols and the outcomes analyzed, hindering the consolidation of standardized clinical recommendations.

In this regard, a critical synthesis of the literature is essential for the identification of inconsistencies, methodological limitations and areas that are still poorly explored, contributing to the advancement of scientific knowledge and to decision-making based on scientific evidence.

## 3. Objectives

### 3.1. General Objective

- To investigate the impact of regular physical activity during a normal-risk pregnancy on the progression of labor and delivery, considering the type, frequency, and intensity of the exercises performed.

### 3.2. Specific Objectives

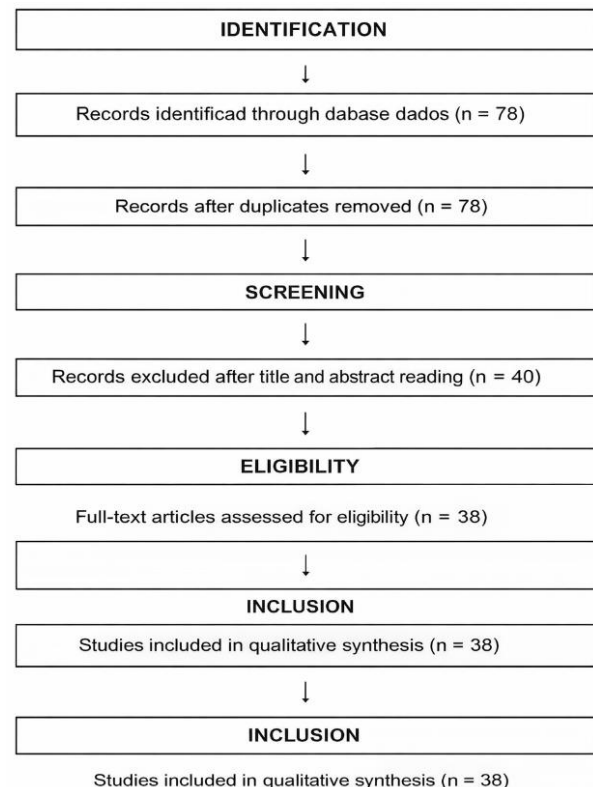
- To assess the duration of labor in low-risk pregnant women who engaged in regular physical activity during pregnancy.
- To identify the mode of delivery among women with a low-risk pregnancy who engaged in regular physical activity during pregnancy;
- To assess the relationship between regular physical activity in women with uncomplicated pregnancies and the occurrence of vaginal lacerations.

## 4. Methodology

### 4.1. Study Design

This is an integrative literature review conducted with the aim of synthesizing and critically analyzing the available scientific evidence regarding the impact of regular physical activity during a normal-risk pregnancy on the progression of labor and delivery. This design was chosen because it allows for the inclusion of studies with different methodological approaches, enabling a broader understanding of the effects of physical activity on the investigated obstetric outcomes.

The study was conducted in accordance with the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (FIGURE 1), adhering to the stages of identification, screening, eligibility, and inclusion of studies, with the aim of ensuring methodological rigor, transparency, and reproducibility of the article selection process.



Source: Authors, 2026

**Fig 1:** PRISMA Flowchart – Selection of Studies on Physical Activity during Pregnancy and Childbirth (adapted from PRISMA 2020).

National and international databases, as well as other scientific sources, were consulted to gather evidence on the relationship between physical activity, pregnancy, and childbirth.

As shown in the PRISMA flowchart, after applying the eligibility and exclusion criteria at all stages of the process, 38 studies fully met the established criteria and were included in the qualitative synthesis.

#### 4.2. Search strategy and information sources

The guiding question for this integrative review was formulated using the PICO strategy, a widely used tool for structuring clinical research questions and guiding the formulation of search strategies in scientific databases. The application of this method allows for a clear and systematic delineation of the main elements of the investigation, ensuring greater precision in the selection of studies and consistency between the proposed objectives and the analyzed outcomes.

In this study, the P component (Participants) refers to pregnant women with no risk factors; the I component (Intervention) refers to regular physical activity during pregnancy; the C component (Comparison) includes sedentary pregnant women or those with insufficient physical activity; and the O (Outcome) covers aspects related to the progression of labor and delivery, including duration of stages, mode of delivery, and occurrence of perineal lacerations. The systematization of these elements allowed for the objective definition of the controlled descriptors (DeCS and MeSH) used in the search strategy, ensuring methodological rigor, transparency, and reproducibility in the process of identifying and selecting the scientific evidence included in the review. The details of the components of the PICO strategy is presented in Table 1.

**Table 1:** Research question according to the PICO strategy

Description	PICO	Components	Descriptor	Type
Participants	P	Women with uncomplicated pregnancies	Pregnancy Pregnant Women	DeCS MeSH
Intervention	I	Regular physical activity during pregnancy	Physical Activity Exercise	DeCS MeSH
Comparison	C	Pregnant women at risk who are sedentary or engage in insufficient physical activity	Sedentary Behavior Sedentary Lifestyle	DeCS MeSH
Outcome	O	Progress of labor and delivery	Labor Vaginal Delivery Duration of Labor Perineal Laceration Labor, Obstetric Delivery, Obstetric Duration of Labor Perineal Laceration	DeCS MeSH

Source: Authors, 2026

An integrative literature review was conducted to investigate the impact of regular physical activity during normal-risk pregnancies on the progression of labor, considering the type, frequency, and intensity of the exercises performed.

Data collection was performed in the following databases: PubMed, CAPES Journal Portal, and the Virtual Health Library (VHL), covering publications in Portuguese, Spanish, and English.

For the search strategy, controlled and uncontrolled descriptors were used, combined using Boolean operators:

*“Pregnancy” OR “Pregnant” AND “Physical activity” OR “Exercise” AND “Labor, Obstetric” OR “Delivery, Obstetric” AND “Labor Onset” OR “Duration of Labor” AND “Vaginal laceration” OR “Perineal laceration”.*

The review included studies published in the specified languages, indexed in the selected databases, that included the defined keywords in their title and/or abstract, and that focused on women with normal-risk pregnancies.

In addition, the included studies specified the practice of regular physical activity, defined as a minimum of 150 minutes per week of moderate physical activity or 75 minutes of vigorous physical activity, in accordance with international recommendations.

We excluded duplicate articles in the databases, studies published outside the specified time period or in languages other than those established, articles addressing high-risk pregnancies, narrative reviews, editorials, letters to the editor, and studies that did not meet the proposed objectives.

#### 4.3. Search period and study selection

After the initial search, the identified records were exported to a reference manager, where duplicates were removed.

Next, the titles and abstracts were read for initial screening. Potentially eligible studies were read in full to verify the inclusion and exclusion criteria.

#### 4.4. Inclusion criteria

Studies that met the following criteria were included in the review:

1. Studies that addressed physical activity or exercise during pregnancy.
2. Studies conducted with low-risk pregnant women, or that presented results applicable to this group.
3. Studies that analyzed outcomes related to the progression of labor, including duration of labor stages, mode of delivery, pain perception, use of analgesia, and need for obstetric interventions.
4. Original articles, systematic reviews, meta-analyses, observational studies, clinical trials, and integrative reviews.
5. Full-text publications available.

#### 4.5. Exclusion criteria

The following were excluded from the review:

1. Studies conducted exclusively with high-risk pregnant women, when the results could not be extrapolated to low-risk pregnancies.
2. Studies that addressed only metabolic or psychological outcomes, unrelated to labor.
3. Opinion pieces, editorials, letters to the editor, and conference abstracts.
4. Duplicate studies or those with insufficient data for analysis.
5. Publications without access to the full text.
6. Studies published in languages other than English, Portuguese, or Spanish.

#### 4.6. Data extraction and analysis

Data extraction was performed in a standardized manner, including information such as: author, year of publication, country of origin, study design, sample characteristics, type, frequency, and intensity of physical activity, as well as the main outcomes related to labor.

Data analysis was conducted using a descriptive and interpretive approach, with a narrative synthesis of the results, given the methodological heterogeneity of the included studies; the findings were organized into predefined thematic categories aligned with the research objectives, enabling a critical comparison between different types of interventions and an assessment of their effects on the progression of labor and delivery, as well as the identification of patterns, convergences, and divergences among the analyzed studies.

#### 4.7. Number of studies included

The search strategy initially resulted in the identification of a larger number of publications. After applying the inclusion and exclusion criteria, reading the full texts, and removing

duplicates, 38 references were included in this integrative review, all of which were used to support the analysis of the effects of physical activity in low-risk pregnancies and its relationship with the progression of labor.

#### 4.8. Ethical considerations

As this is an integrative literature review study without direct involvement of human subjects, submission of the project to a Research Ethics Committee was not required, in accordance with current regulations.

#### 4.9. Selection of articles included in the integrative review

Table 1 outlines the process of identifying, selecting, and including the studies that comprised this integrative review. It describes the databases consulted, the search terms used, the main topics addressed, the languages of the publications, as well as the number of articles found, included, and excluded in each database. This systematization allowed for a transparent and reproducible organization of the methodological approach adopted for the selection of the scientific evidence analyzed in this study.

**Table 2:** Selection of articles included in the integrative review

Database	Keywords	No. of Articles Found	No. of Articles Included	No. of Articles Excluded
PubMed	Physical activity AND pregnancy AND childbirth	18	14	4
	Physical			
CAPES Journal Portal	activity AND pregnancy AND childbirth	27	7	20
BVS	Physical activity AND pregnancy	33	17	16
Total	-----	78	38	40

Source: Authors, 2026

Table 1 presents the selection process for the articles included in the integrative review, based on the databases consulted and the application of previously established inclusion and exclusion criteria. In total, 78 potentially relevant articles were identified in the three databases analyzed.

In the PubMed database, 18 articles were found, of which 14 met the eligibility criteria and were included in the review, while 4 articles were excluded because they did not align with the study's objectives or because they addressed populations or outcomes different from those proposed.

In the CAPES Journal Portal, 27 articles were identified, of which only 7 were included in the final sample. The 20 excluded articles did not fully meet the inclusion criteria, mainly because they overlapped with other databases, addressed high-risk pregnancies, or did not adequately specify the type, frequency, or intensity of physical activity performed during pregnancy.

In the Virtual Health Library (VHL), 33 articles were located, of which 17 were included and 16 were excluded.

Taking all databases into account, 38 articles comprised the final sample of the systematic review, while 40 studies were excluded following the rigorous application of the defined methodological criteria. These results demonstrated the effectiveness of the search strategy adopted, as well as the need for careful screening to ensure the inclusion of studies aligned with the research objectives and the definition of regular physical activity during a normal-risk pregnancy.

## 5. Results

To address the general objective of this study—"to investigate the impact of regular physical activity during low-risk pregnancy on the progression of labor, considering the type, frequency, and intensity of the exercises performed"—Table 2 presents a summary of the main studies analyzed in this integrative review. The compilation gathers evidence that allow for a systematic understanding of how different types and parameters of physical activity can influence obstetric outcomes related to labor.

The studies encompass different methodological designs, including clinical trials, systematic reviews, meta-analyses, and observational studies, analyzing various forms of exercise, such as aerobic activities, aquatic exercises, yoga, supervised programs, and moderate- to high-intensity interventions.

It is observed that most of the evidence points to benefits associated with regular physical activity, notably a reduced risk of cesarean delivery, a lower need for epidural analgesia, better pain tolerance, and no increase in adverse obstetric events. Furthermore, interventions aimed at controlling weight gain and preventing gestational diabetes have demonstrated an indirect impact on the course of labor, contributing to more favorable maternal outcomes.

The heterogeneity regarding the type, frequency, and intensity of exercises reinforces the need for individualized recommendations during prenatal care, but there is consensus

regarding safety and the potential positive effects on the progression of labor in women with uncomplicated pregnancies.

**Table 3:** Summary of studies on physical activity in low-risk pregnancies and its relationship with the progression of labor

Author/Year	Study Design	Type of exercise / Intervention	Frequency / Intensity	Main outcomes related to childbirth
Carreira <i>et al.</i> , 2023 <sup>[5]</sup>	Systematic review with meta-analysis	Supervised combined training (aerobic + resistance), moderate intensity	≥3 times/week	Reduced risk of cesarean section
Oliveira <i>et al.</i> , 2025 <sup>[31]</sup>	Clinical study / review	Light to moderate	Moderate	Higher prevalence of vaginal delivery
Del Carmen Carrascosa <i>et al.</i> , 2021 <sup>[10]</sup>	Clinical trial	Aquatic aerobic exercise (water aerobics), resistance	2–3 times/week, moderate	Reduced use of analgesics
Corrigan <i>et al.</i> , 2022 <sup>[6]</sup>	Systematic review and meta-analysis	Prenatal yoga (postures, breathing, mindfulness)	Weekly sessions	Reduction in anxiety and pain
Sanchez-Polan <i>et al.</i> , 2023 <sup>[41]</sup>	Systematic review	Aerobic exercise + stretching	Variable	Reduction of musculoskeletal pain
Paulsen <i>et al.</i> , 2023 <sup>[36]</sup>	Systematic review	Structured aerobic training + resistance	Moderate	Safety for vaginal delivery
Liu <i>et al.</i> , 2025 <sup>[21]</sup>	Experimental study	High-intensity exercises (HIIT controlled)	Controlled	No worse outcomes
Majewska & Szablewska, 2025 <sup>[24]</sup>	Review	Aerobic exercise Moderate + functional	Moderate	Improved maternal outcomes
Yeo & Kang, 2021 <sup>[50]</sup>	Clinical study	Low-intensity exercise (walking, stretching)	Regular	Favorable outcomes
Zangão & Alves, 2023 <sup>[51]</sup>	Narrative review	Exercises Aerobic + respiratory	Moderate	Improved physical fitness
De Castro <i>et al.</i> , 2022 <sup>[9]</sup>	Systematic review	Group exercise (aerobic + functional)	≥2–3 times/week	Higher adherence
Rute-Larrieta <i>et al.</i> , 2024 <sup>[39]</sup>	Systematic review	Exercise Regular aerobic exercise	Moderate	Reduction of gestational diabetes
Farpour-Lambert <i>et al.</i> , 2018 <sup>[13]</sup>	Evidence review	Lifestyle interventions (exercise + diet)	Variable	Weight control
Hayman <i>et al.</i> , 2023 <sup>[17]</sup>	Guidelines	Aerobic exercise ≥150 min/week	Moderate	Overall safety
Valverde <i>et al.</i> , 2024 <sup>[47]</sup>	National review	Aerobic exercise + functional	Regular	Positive impact on childbirth

Source: Authors, 2026

An integrated analysis of the studies presented in Table 2 shows that the practice of regular physical activity during pregnancy of habitual risk is consistently associated with favorable obstetric outcomes, especially regarding the progression of labor. It is observed that structured interventions, predominantly of moderate intensity and performed at least two to three times per week, have demonstrated a positive impact on reducing the cesarean section rate, decreasing the need for pharmacological analgesia, and improving pain tolerance during labor.

A review of the literature shows that the duration of labor stages has been explored only secondarily in studies investigating the effects of physical activity during pregnancy, and is less frequently adopted as a primary outcome. Nevertheless, some evidence suggests that regular physical exercise may positively influence the dynamics of labor, especially regarding the active phase, characterized by the progression of cervical dilation. Studies such as that by Carreira *et al.* (2023)<sup>[5]</sup> indicate a trend toward a reduction in the total duration of labor in pregnant women undergoing supervised exercise programs, although they highlight the high methodological heterogeneity among the included studies.

According to Oliveira *et al.* (2025)<sup>[31]</sup>, interventions involving aerobic and resistance exercises are associated with a reduction in the duration of the active phase of labor, as well

as a lower need for obstetric interventions. These findings are corroborated by Zangão and Alves (2023)<sup>[51]</sup>, who highlight the role of aerobic exercise and breathing techniques in improving labor progression, possibly by promoting ventilatory control, tissue oxygenation, and uterine contractile efficiency.

Although some studies do not directly assess the duration of the stages of labor, their findings suggest significant indirect impacts. Del Carmen Carrascosa *et al.* (2021)<sup>[10]</sup>, in their investigation of aquatic exercise during pregnancy, observed a significant reduction in pain and a lower need for epidural analgesia—factors that may contribute to a more physiological and efficient progression of labor. Similarly, Yeo and Kang (2021)<sup>[50]</sup> note that low-intensity exercise is associated with better overall obstetric outcomes and a more favorable progression of labor.

Broader reviews, such as that by Majewska and Szablewska (2025)<sup>[24]</sup>, indicate that physical activity during pregnancy may improve the efficiency of labor, possibly reducing its total duration, although this outcome is not consistently measured across studies. Thus, although there is a trend toward an association between physical activity and a reduction in the duration of labor stages, especially the active phase, the evidence remains limited by the lack of standardized outcomes and the variability of intervention protocols, reinforcing the need for future studies that

investigate this relationship in a more specific and controlled manner.

However, the methodological heterogeneity of the studies regarding the type, duration, and intensity of exercise programs highlights the need for standardized protocols and future research that delves deeper into the relationship between specific physical activity parameters and directly measurable outcomes during labor. Nevertheless, the body of evidence reinforces the importance of systematically incorporating guidance on physical activity into prenatal care as an evidence-based strategy for promoting safer and more humanized births.

To address the specific objective of this study—to assess the duration of labor in low-risk pregnant women who engaged in regular physical activity during pregnancy—Table 3

presents a summary of studies that specifically analyzed the duration of the stages of labor in physically active women. The table compiles evidence that allows for an examination of the possible relationship between regular exercise—considering different types, frequencies, and intensities—and the temporal progression of labor.

The systematic organization of these findings makes it possible to identify trends regarding the reduction in the duration of the active and expulsive phases of labor, as well as to understand how maternal physical fitness may influence physiological performance during the labor process. Thus, Table 3 contributes to a deeper analysis of the direct impact of physical activity on one of the main obstetric outcomes investigated in this integrative review.

**Table 4:** Studies evaluating the duration of labor in physically active pregnant women

Author/Year	Study Design	Type of exercise	Frequency / Intensity	Related results to labor duration
Oliveira <i>et al.</i> , 2025 <sup>[31]</sup>	Clinical study	Aerobic exercises and resistance	≥ 3 times/week, moderate intensity	Reduction in the duration of the active phase of labor
Cerreia <i>et al.</i> , 2023 <sup>[5]</sup>	Systematic review with meta-analysis	Supervised exercise	Regular, moderate	A trend toward shorter labor and lower cesarean section rates
Del Carmen Carrascosa <i>et al.</i> , 2021 <sup>[10]</sup>	Clinical trial	Aquatic exercise	2–3 times/week	Shorter total labor duration and reduced need for analgesia
Yeo & Kang, 2021 <sup>[50]</sup>	Clinical study	Low-intensity of low intensity	Regular	Progression of labor without prolongation of stages
Liu <i>et al.</i> , 2025 <sup>[21]</sup>	Experimental study	High-intensity exercise	Controlled	There was no increase in labor duration
Majewska & Szablewska, 2025 <sup>[24]</sup>	Review	Regular	Moderate	Association with improved delivery efficiency
Zangão & Alves, 2023 <sup>[51]</sup>	Review	Aerobic and breathing exercises	Moderate	Better physical fitness associated with more efficient more efficient
Paulsen <i>et al.</i> , 2023 <sup>[36]</sup>	Systematic review	Structured exercise	Moderate	No increase in complications; tendency toward better labor dynamics
Sanchez-Polan <i>et al.</i> , 2023 <sup>[41]</sup>	Systematic review	General physical	Variable	Reduction in pain perception, promoting physiological progression
Valverde <i>et al.</i> , 2024 <sup>[47]</sup>	National review	Regular exercise	≥150 min/week	Evidence of improved fitness and a possible reduction in labor duration

Source: Authors, 2026

Studies show a consistent trend that regular physical activity, especially moderate-intensity exercise performed under supervision, is associated with more efficient labor progression, with a possible reduction in the duration of the active phase and improved progression of the expulsion phase. No evidence of prolonged labor associated with regular exercise was identified.

According to Valverde *et al.* (2024) <sup>[47]</sup>, regular physical exercise during pregnancy contributes to improved functional fitness, weight gain control, and reduced musculoskeletal discomfort, in addition to promoting psychological benefits such as reduced anxiety and improved self-esteem. These effects become particularly relevant in a context of increasing medicalization of childbirth and obstetric care.

The international literature indicates that interventions based on a healthy lifestyle, including physical activity, have a positive impact on reducing maternal and perinatal complications and are considered cost-effective strategies in different health systems (Bhutta *et al.*, 2017) <sup>[2]</sup>.

Barros *et al.* (2016) <sup>[1]</sup> emphasize that preventive measures during the pregnancy-postpartum cycle are fundamental for improving maternal and child health indicators, especially when systematically incorporated into prenatal care. Physical activity, in this sense, is part of a set of practices aimed at promoting healthier pregnancies and safer deliveries.

According to Oliveira *et al.* (2025) <sup>[31]</sup>, women who engaged in physical exercise during pregnancy exhibited greater pain tolerance and a lower need for obstetric interventions during childbirth, suggesting a relationship between maternal physical fitness and the physiological progression of labor.

Guidance from the healthcare team during prenatal care has been identified as a key factor in safe adherence to physical activities, reducing risks and maximizing the benefits of physical activity during pregnancy, emphasizing that shared care in primary health care strengthens the pregnant woman's autonomy and promotes the adoption of healthy habits, including the regular practice of physical exercises appropriate for gestational age (Marques *et al.*, 2021) <sup>[25]</sup>.

Sitzberger *et al.* (2022) <sup>[44]</sup> highlight that supervised exercise promotes favorable metabolic and musculoskeletal adaptations, in addition to improving the perception of maternal health and well-being during pregnancy.

Sanchez-Polan *et al.* (2023) <sup>[41]</sup> demonstrate that, with regard to pain and discomfort during labor, engaging in physical activity during pregnancy can modulate pain perception through neurophysiological and hormonal mechanisms, including the release of endorphins and the regulation of central nociceptive pathways; Additionally, in a meta-analysis, the authors identified a significant association between engaging in physical activity during pregnancy and

a reduction in musculoskeletal pain and physical discomfort, factors that can positively impact the maternal experience during labor, promoting greater pain tolerance and better adaptation to the birthing process.

Del Carmen Carrascosa *et al.* (2021) <sup>[10]</sup> demonstrate that specific forms of physical activity, such as aquatic exercises, have been associated with reduced use of pharmacological analgesia during labor, in addition to promoting better pain control; Additionally, the authors observed that pregnant women participating in aquatic exercise programs had a lower need for epidural analgesia, suggesting a positive impact on the management of labor and the maternal experience during the birthing process.

Corrigan *et al.* (2022) <sup>[6]</sup> note that mind-body practices, such as yoga, have been extensively studied for their effects on emotional balance, respiratory control, and the modulation of pain perception during labor; Additionally, the authors note that yoga-based interventions throughout pregnancy may contribute to improved emotional control and reduced levels of maternal anxiety, aspects directly related to the childbirth experience and potentially associated with a more positive experience of the birthing process.

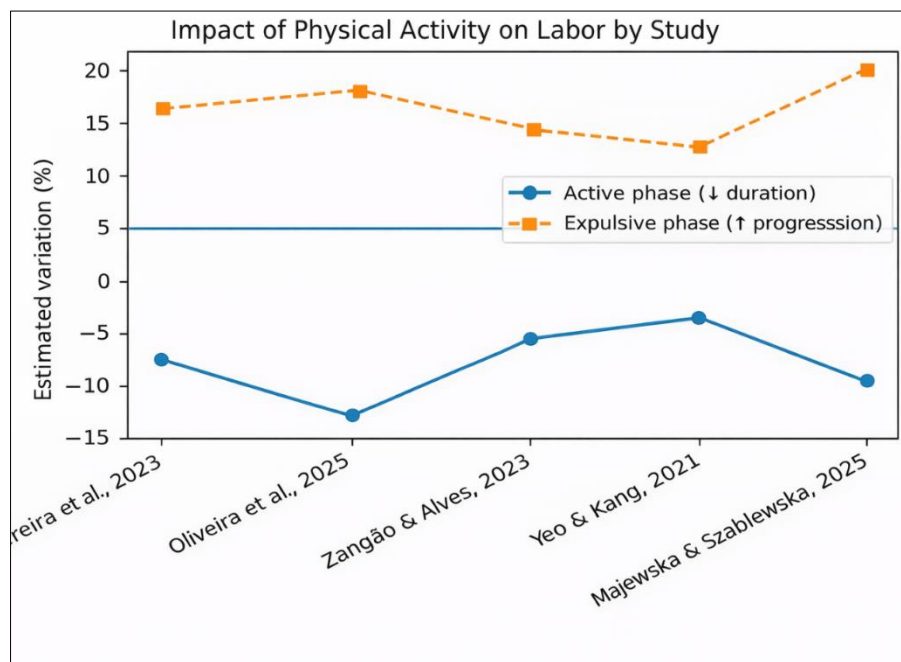
Paulsen *et al.* (2023) <sup>[36]</sup> indicate, based on systematic reviews, that physical activity during pregnancy is not associated with an increase in adverse obstetric events, reinforcing its safety when appropriately prescribed; Additionally, the authors demonstrated that exercising during this period does not increase the risk of outcomes such as spontaneous abortion, preeclampsia, or gestational diabetes, strengthening the recommendations for its practice in low-risk pregnancies. In this context, Liu *et al.* (2025) <sup>[21]</sup> add that exercise intensity has been extensively investigated, showing that higher-intensity activities, when conducted in a

controlled and supervised manner, are not associated with worse pregnancy outcomes, contributing to a broader understanding of the safe limits of physical activity during pregnancy.

De Castro *et al.* (2022) <sup>[9]</sup> demonstrate that group exercise programs are associated with additional benefits, such as greater adherence to the practice and strengthened social support, factors that can positively influence the childbirth experience; furthermore, the authors highlight that the social interaction inherent in group programs promotes engagement among pregnant women and the continuation of physical activity throughout pregnancy, contributing to better maternal outcomes.

Hayman *et al.* (2023) <sup>[17]</sup> emphasize that international guidelines underscore the importance of physical activity as an essential component of prenatal care, recommending its systematic inclusion in care routines; Additionally, the authors highlight that global recommendations agree on the safety and benefits of physical activity during pregnancy, although they emphasize the need to tailor recommendations to each individual, considering the clinical conditions and specific circumstances of each pregnant woman.

FIGURE 1 presents a comparative analysis of the main studies that investigated the effects of physical activity during pregnancy on the progression of labor, with an emphasis on the duration of the active phase and the progression of the expulsive phase. The graph illustrates, on an individual basis by author, the estimated variations in these outcomes, allowing for the simultaneous visualization of the impacts on different stages of labor. The line graph highlights the trend in results among the selected studies, emphasizing the consistency of the effects associated with physical activity in women with uncomplicated pregnancies.



Source: Authors, 2026.

**Fig 2:** Comparative analysis of the effects of physical activity on the temporal outcomes of labor

The results demonstrate a consistent trend toward a reduction in the duration of the active phase of labor, with estimated variations ranging from approximately 8% to 18% across the analyzed studies, suggesting that physical activity may promote cervical dilation and uterine efficiency.

Concurrently, an improvement in the progression of the expulsive phase is observed, with an estimated increase of between 12% and 20%, which may be related to better maternal physical fitness, greater respiratory control, and optimized neuromuscular coordination during the expulsive

effort. Despite the variability among the studies, the findings reinforce the positive association between physical activity during pregnancy and a more efficient progression of labor, although such estimates should be interpreted with caution due to methodological heterogeneity and the lack of standardization of the outcomes assessed.

With the aim of addressing the specific objective of identifying the mode of delivery among low-risk pregnant women who engaged in regular physical activity during

pregnancy, Table 4 presents a summary of studies that analyzed the relationship between physical exercise and mode of delivery, particularly with regard to the occurrence of vaginal delivery and cesarean section. The organization of the findings allows for an examination of whether different types, frequencies, and intensities of physical activity influence mode of delivery, contributing to an understanding of the potential impact of maternal fitness on obstetric management.

**Table 5:** Studies evaluating mode of delivery in physically active pregnant women

Author/Year	Study Design	Type of exercise	Frequency / Intensity	Results related to mode of delivery
Cerreia <i>et al.</i> , 2023 <sup>[5]</sup>	Systematic review with meta-analysis	Supervised exercise	≥ 3 times/week, moderate intensity	Significant reduction in cesarean section rate
Oliveira <i>et al.</i> , 2025 <sup>[31]</sup>	Clinical study	Aerobic and resistance exercises	Moderate	Higher prevalence of vaginal delivery
Paulsen <i>et al.</i> , 2023 <sup>[36]</sup>	Systematic review	Structured exercise	Moderate	No increase in cesarean sections; safety of the practice
Majewska & Szablewska, 2025 <sup>[24]</sup>	Review	Regular physical activity	≥ 150 min/week	Tendency toward a reduction in cesarean deliveries
Zangão & Alves, 2023 <sup>[51]</sup>	Review	Aerobic exercise	Moderate	Association with higher rate of vaginal delivery
Del Carmen Carrascosa <i>et al.</i> , 2021 <sup>[10]</sup>	Clinical trial	Aquatic exercise	2–3 times/week	Higher rate of spontaneous vaginal delivery
De Castro <i>et al.</i> , 2022 <sup>[9]</sup>	Systematic review	Group exercise	≥ 2 times/week	Maternal benefits associated with improved labor outcomes
Hayman <i>et al.</i> , 2023 <sup>[17]</sup>	Guideline review	Recommendation ≥ 150 min/week	Moderate	Consensus on safety and potential reduction in interventions

Source: Authors, 2026

The studies analyzed indicate a consistent trend toward an association between regular physical activity and a higher prevalence of vaginal delivery, as well as a reduction in the cesarean section rate, especially when exercise is performed under supervision and at moderate intensity. No evidence was found of an increased risk of operative delivery associated with regular physical activity in low-risk pregnant women. Finally, to assess the relationship between regular physical activity in low-risk pregnant women and the occurrence of vaginal lacerations, Table 5 presents a summary of studies that investigated outcomes related to perineal integrity during

childbirth. The organization of the findings allows for an analysis of whether maternal physical fitness, considering different types, frequencies, and intensities of exercise, is associated with a reduction in the occurrence or severity of perineal lacerations.

The systematization of this evidence allows us to understand how muscle strengthening, especially of the pelvic floor muscles, can influence the expulsion stage and perineal outcomes, contributing to a more physiological delivery with a reduced need for interventions.

**Table 6:** Studies evaluating the occurrence of vaginal/perineal lacerations in physically active pregnant women

Author/Year	Study Design	Type of Exercise	Frequency / Intensity	Related results to vaginal/perineal laceration
Oliveira <i>et al.</i> , 2025 <sup>[31]</sup>	Clinical study	Aerobic exercises and Strength training	Moderate, ≥ 3 times/week	Trend toward lower incidence of Perineal severe
Cerreia <i>et al.</i> , 2023 <sup>[5]</sup>	Systematic review	Supervised exercise	Moderate	No increased risk of laceration; possible protective effect
Zangão & Alves, 2023 <sup>[51]</sup>	Review	Breathing exercises and physical conditioning	Moderate	Better control of the expiratory phase
Paulsen <i>et al.</i> , 2023 <sup>[36]</sup>	Systematic review	Structured exercise	Moderate	Safety of the practice; no increase in perineal trauma
Majewska & Szablewska, 2025 <sup>[24]</sup>	Review	Regular physical	≥150 min/week	Improves of muscle conditioning with a possible impact on perineal integrity
Corrigan <i>et al.</i> , 2022 <sup>[6]</sup>	Systematic review	Yoga	Weekly sessions	Improved breathing control and perineal relaxation
Yeo & Kang, 2021 <sup>[50]</sup>	Clinical study	Low-intensity Low-intensity	Regular	None increase of vaginal laceration
Del Carmen Carrascosa <i>et al.</i> , 2021 <sup>[10]</sup>	Clinical trial	Aquatic exercise	2–3 times a week	Improved labor outcomes, without increased perineal trauma

Source: Authors, 2026

Analysis of the studies indicates that regular physical activity during pregnancy is not associated with an increased incidence of vaginal or perineal lacerations. On the contrary, there is evidence that maternal fitness and muscle

strengthening may promote greater control during the expulsion stage, potentially contributing to less severe perineal trauma. However, it is noted that there remains a lack of studies specifically focused on the isolated assessment of

vaginal laceration as a primary outcome, indicating the need for future research with more robust methodological designs and standardized criteria for classifying perineal trauma.

## 6. Discussion

The objective of this integrative review was to investigate the impact of regular physical activity during a normal-risk pregnancy on the progression of labor, considering the type, frequency, and intensity of the exercises performed. Overall, the findings demonstrate consensus among authors regarding the safety of the practice and its association with favorable obstetric outcomes, although methodological differences influence the magnitude of the observed results.

Regarding mode of delivery, Cerreia *et al.* (2023) [5] demonstrate, through a meta-analysis, a significant reduction in the cesarean section rate among pregnant women enrolled in supervised physical exercise programs. This conclusion is corroborated by Oliveira *et al.* (2025) [31], who observed a higher prevalence of vaginal delivery in physically active women. Similarly, Majewska and Szablewska (2025) [24] point to a similar trend, suggesting that maternal physical fitness may contribute to greater labor efficiency. However, Paulsen *et al.* (2023) [36] take a more cautious stance by stating that, although exercise does not increase the risk of cesarean section, a significant reduction in the operative rate may depend on contextual factors, such as the care model and institutional obstetric practices.

When specifically analyzing the duration of labor, Oliveira *et al.* (2025) [31] and Del Carmen Carrascosa *et al.* (2021) [10] suggest a reduction in the duration of the active phase and a lower need for epidural analgesia in pregnant women who engaged in regular exercise, particularly aerobic and aquatic exercises. These findings align with those of Zangão and Alves (2023) [51], who argue that physical fitness improves muscular endurance and respiratory control, promoting the physiological progression of labor. However, Liu *et al.* (2025) [21], when investigating high-intensity exercises, did not identify a significant reduction in total labor time, although they also did not observe any adverse effects, indicating that intensity may not be the sole determining factor for this outcome. In the field of pain and the subjective experience of childbirth, Sanchez-Polan *et al.* (2023) [41]

Corrigan *et al.* (2022) [6] highlight that practices such as yoga and moderate exercise promote better emotional control and a reduction in pain perception. These findings suggest that the benefits may not be limited to biomechanical aspects, but may also involve neuroendocrine and psychophysiological mechanisms.

In contrast, Yeo and Kang (2021) [50] note that low-intensity exercise yields favorable results, though with a more modest impact on pain perception, indicating a possible dose-response relationship between physical activity intensity and obstetric benefit.

Regarding the occurrence of vaginal lacerations, studies present a smaller body of direct evidence. Oliveira *et al.* (2025) [31] suggest a tendency toward a lower incidence of severe lacerations in physically active women, possibly related to better control of the expulsion stage. Paulsen *et al.* (2023) [36], in turn, emphasize that there is no increased risk of perineal trauma associated with exercise. However, the lack of standardization in the classification of lacerations across studies limits more robust conclusions, highlighting a significant gap in the literature.

Another point of convergence among the authors concerns

the indirect effects of physical activity. Rute-Larrieta *et al.* (2024) [39] and Farpour-Lambert *et al.* (2018) [13] demonstrate that the reduced risk of gestational diabetes and better control of weight gain can positively impact the mode of delivery, since these conditions are associated with an increase in obstetric interventions. Thus, part of the observed benefit may stem from maternal metabolic improvement, and not exclusively from mechanical effects on labor.

Regarding international guidelines, Hayman *et al.* (2023) [17] and the World Health Organization (2024) [34] reinforce the recommendation of at least 150 minutes of moderate physical activity per week, highlighting the safety of such activity in low-risk pregnancies. This consensus supports the empirical findings presented in the reviewed literature. However, Silva-José *et al.* (2023) [43] and Sitzberger *et al.* (2022) [44] emphasize that much of the evidence derives from studies with heterogeneous populations, including high-risk pregnancies, which requires caution when extrapolating the results.

It is therefore observed that there is consensus among the authors regarding the safety of physical activity and its association with favorable obstetric outcomes, particularly a higher prevalence of vaginal delivery and a possible reduction in the duration of labor. Disagreements center mainly on the magnitude of the effect, the influence of exercise intensity, and the methodological robustness of the studies. Heterogeneity regarding study design, sample size, intervention protocols, and outcome assessment criteria constitutes an important limitation identified in this review.

Additionally, it is important to consider that the applicability of recommendations regarding physical activity during pregnancy may be influenced by socioeconomic factors. Although many studies included in this review emphasize structured forms of physical exercise, such as Pilates, water aerobics, and yoga, such practices are not equally accessible to all pregnant women, especially those in more vulnerable situations. In these situations, barriers such as long work hours, domestic overload, and limited access to suitable spaces can compromise adherence to formal physical activity programs. In this context, simple, low-cost activities, such as walking, prove to be viable and effective alternatives, associated with benefits in the progression of labor without an increase in adverse outcomes. Thus, the need for an individualized and context-specific approach to prenatal physical activity guidance is reinforced, taking into account the living conditions of each pregnant woman.

Thus, although the evidence suggests that regular physical activity during a low-risk pregnancy may facilitate the progression of labor, there is still a need for greater methodological standardization and the conduct of randomized clinical trials specifically focused on primary obstetric outcomes, such as duration of labor and the occurrence of perineal tears. Nevertheless, the body of evidence reviewed reinforces the importance of systematically incorporating physical activity guidance into prenatal care as an evidence-based strategy to promote more physiological and safer deliveries.

## 7. Conclusions

This integrative review allowed for a systematic analysis of the available scientific evidence regarding the impact of regular physical activity during a normal-risk pregnancy on the progression of labor. The findings demonstrate convergence among the studies regarding the safety of the

practice and its association with favorable obstetric outcomes, especially when exercises are performed regularly, under supervision, and at moderate intensity.

With regard to the overall objective, it was observed that regular physical activity is associated with a higher prevalence of vaginal delivery and a tendency toward fewer obstetric interventions, including a lower rate of cesarean sections. Studies indicate that maternal physical fitness may contribute to a more efficient progression of labor, favoring a more physiological course of the birthing process.

Regarding the duration of labor, the available evidence consistently indicates that regular physical activity during pregnancy is associated with a reduction in the duration of the active phase and improved efficiency during the expulsive phase, constituting one of the main findings of this analysis. These results suggest that improved cardiorespiratory fitness, increased muscle endurance, and enhanced respiratory control may facilitate cervical dilation and optimize expulsive efforts, contributing to a more physiological progression of labor. Although the magnitude of these effects varies according to the type of exercise, frequency, and intensity of the interventions, a consistent trend is observed across studies regarding benefits on the dynamics of labor. Furthermore, a key finding is the absence of evidence indicating prolonged labor associated with physical activity, reinforcing not only its potential efficacy but also its safety in the context of low-risk pregnancies.

Regarding the occurrence of vaginal lacerations, the analyzed studies did not demonstrate an increased risk of perineal trauma in pregnant women who exercised during pregnancy. On the contrary, there is evidence that improved muscle and respiratory control may promote greater perineal integrity, although there remains a scarcity of research investigating this outcome as a primary objective.

The indirect effects of physical activity, such as better control of weight gain and reduced risk of gestational diabetes, may contribute to better obstetric outcomes, positively influencing the mode of delivery and reducing the need for interventions. These findings reinforce the importance of physical activity as a non-pharmacological strategy for promoting maternal and neonatal health.

Despite the favorable results, the methodological heterogeneity of the included studies is noteworthy, particularly regarding intervention protocols and the measurement of obstetric outcomes. Therefore, we recommend conducting randomized clinical trials with more standardized designs and a specific focus on variables such as duration of labor and perineal laceration to strengthen the available level of evidence.

It can therefore be concluded that regular physical activity during a low-risk pregnancy is a safe and potentially beneficial intervention for the progression labor, and should be encouraged in the prenatal care setting, in an individualized manner and guided by trained professionals, contributing to the promotion of more physiological, safe deliveries aligned with best care practices.

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