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REVIEW ARTICLE

Labor Position and Its Impact on The Birth Process: A Literature Review

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Abstract

Variations in labor positions can enhance childbirth by improving maternal comfort, satisfaction, and reducing complications like prolonged labor and perineal trauma. This review aimed to evaluate the impact of labor positions on specific outcomes: duration of labor, perineal integrity, maternal comfort, and medical intervention rates. A systematic literature search was conducted in April 2025 using PubMed, SpringerLink, and ScienceDirect databases, employing keywords such as "birthing position," "maternal outcomes," and "alternative position during labor." Inclusion criteria were quantitative studies, systematic reviews, and international guidelines; opinion articles, editorials, and case reports were excluded. The PRISMA approach identified 13 studies from an initial 58 records, assessed using the GRADE criteria. Results indicated upright positions (standing, squatting, sitting, kneeling) utilize gravity to significantly shorten the second labor stage, widen pelvic diameter, and reduce medical interventions like cesarean sections. Squatting and kneeling specifically facilitated faster fetal expulsion, whereas lateral positions improved perineal integrity and minimized trauma. This review recommends healthcare facilities adopt flexible labor position policies and highlights the importance of longitudinal and population-based research to further assess the long-term maternal and neonatal impacts of implementing these alternative labor positions.

Keywords: Position, Labor, Birth Process, Maternal Outcomes, Literature Review

Abstrak

Variasi posisi persalinan dapat memperlancar proses kelahiran dengan meningkatkan kenyamanan dan kepuasan ibu serta mengurangi komplikasi seperti persalinan lama dan trauma perineum. Tinjauan ini bertujuan mengevaluasi dampak posisi persalinan terhadap hasil spesifik: durasi persalinan, integritas perineum, kenyamanan ibu, dan tingkat intervensi medis. Pencarian literatur dilakukan secara sistematis pada April 2025 menggunakan basis data PubMed, SpringerLink, dan ScienceDirect dengan kata kunci seperti "birthing position," "maternal outcomes," dan "alternative position during labor." Kriteria inklusi mencakup studi kuantitatif, tinjauan sistematis, dan pedoman organisasi kesehatan internasional; artikel opini, editorial, dan laporan kasus dikecualikan. Pendekatan PRISMA menghasilkan 13 studi dari 58 artikel awal, dengan kualitas bukti dinilai menggunakan kriteria GRADE. Hasil menunjukkan bahwa posisi tegak (berdiri, jongkok, duduk, berlutut) memanfaatkan gravitasi untuk secara signifikan mempercepat kala dua persalinan, memperluas diameter panggul, dan menurunkan intervensi medis seperti seksio sesarea. Posisi jongkok dan berlutut secara khusus mempercepat ekspulsi janin, sementara posisi lateral meningkatkan integritas perineum dan mengurangi risiko trauma. Tinjauan ini merekomendasikan fasilitas kesehatan mengadopsi kebijakan posisi persalinan yang fleksibel serta menekankan pentingnya penelitian longitudinal berbasis populasi untuk mengkaji dampak jangka panjangnya terhadap hasil persalinan.

Kata kunci: Posisi, Persalinan, Proses Kelahiran, Luaran Maternal, Tinjauan Literatu

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INTRODUCTION

The childbirth process is a pivotal event in the lives of women and their families, significantly impacting maternal and neonatal outcomes, as well as long-term maternal physical and psychological well-being (Renfrew et al., 2014). Throughout history, preferences for labor positions have shifted considerably, influenced by cultural beliefs, medical advancements, and technological progress. Historically, many cultures favored upright positions such as squatting, kneeling, or standing, recognizing the benefits of gravity and natural physiological mechanisms in facilitating childbirth (Dekker, 2017; Gizzo et al., 2021). Evidence from anthropological studies also highlights how various cultures around the world traditionally used vertical and mobile positions during labor to optimize maternal comfort and reduce the duration of labor (Dundes, 1987).

However, the lithotomy position, wherein the mother lies flat on her back with legs elevated, became increasingly prevalent in Western medicine, largely because it allowed healthcare providers greater ease in monitoring fetal progress and performing medical interventions (Mselle & Eustace, 2020; Lawrence et al., 2013). Despite this medical convenience, substantial criticism has emerged over recent decades, emphasizing that the lithotomy position often restricts maternal mobility, prolongs labor duration, increases perineal trauma, and negatively impacts maternal satisfaction and comfort (Scholten et al., 2024; DiFranco & Curl, 2014).

In recent years, growing awareness of the physiological and psychological benefits of alternative birthing positions has sparked renewed interest among healthcare providers, researchers, and mothers themselves (Berta et al., 2019; Hemmerich et al., 2019). Modern studies consistently demonstrate that positions such as squatting, standing, kneeling, or side-lying significantly reduce labor duration, enhance maternal comfort and satisfaction, and minimize the incidence of perineal injuries and medical interventions like episiotomies or instrumental deliveries (Scholten et al., 2024; Gupta et al., 2017; Walker et al., 2018). A systematic review by Thies-Lagergren et al. (2013) similarly reported that upright positions are consistently associated with improved maternal satisfaction and fewer perineal complications compared to recumbent positions.

Despite compelling evidence supporting these alternative positions, their routine implementation in clinical practice remains limited. Barriers to adoption include a lack of awareness and adequate training among healthcare professionals, restrictive hospital protocols, limited facility designs that accommodate mobility, and deeply rooted cultural attitudes among medical staff and patients who are accustomed to traditional supine positions (Mselle & Eustace, 2020; Fu et al., 2023; Glover et al., 2024). Additionally, women's personal preferences for birth positions often go unfulfilled due to institutional norms and authoritative healthcare practices, leading to reduced autonomy and satisfaction during childbirth (Scholten et al., 2024; Bohren et al., 2019).

Given these critical insights, a significant research gap persists regarding the effective integration and consistent application of alternative labor positions into routine childbirth practice, specifically concerning outcomes such as labor duration, perineal integrity, maternal comfort, and reduced medical intervention rates. Although numerous studies have highlighted the benefits of alternative labor positions, their practical implementation remains sporadic and lacks standardization across diverse clinical settings (Walker et al., 2018; Satone & Tayade, 2023). Hence, further investigation through systematic reviews, clinical trials, and policy-oriented research is essential to bridge these gaps, optimize maternal health outcomes, and inform evidence-based clinical guidelines (Renfrew et al., 2014; Gizzo et al., 2021).

Therefore, this literature review aims explicitly to investigate the impact of different labor positions, focusing particularly on specific clinical outcomes: duration of labor, perineal integrity, maternal comfort, and the incidence of medical interventions. By synthesizing recent empirical evidence and systematically evaluating current recommendations, this review seeks to inform healthcare practitioners and policymakers about practical strategies to enhance maternity care quality and maternal satisfaction through flexible and evidence-based labor position options.

METHOD

This literature review was conducted using a qualitative descriptive approach to systematically evaluate the scientific findings related to birthing positions and their impact on the labor process. The systematic search was executed in April 2025 utilizing three reputable databases: PubMed, SpringerLink, and ScienceDirect. These databases were selected due to their comprehensive and multidisciplinary collections, which encompass a wide range of peer-reviewed journals relevant to maternal and reproductive health research (Aromataris & Pearson, 2014; Higgins et al., 2022). The keywords employed in the search process were carefully chosen to accurately reflect the research objectives, namely: "birthing position," "delivery position," "maternal outcomes," and "alternative position during labor." These keywords were combined using Boolean operators (AND, OR) to optimize search results and capture all relevant studies.

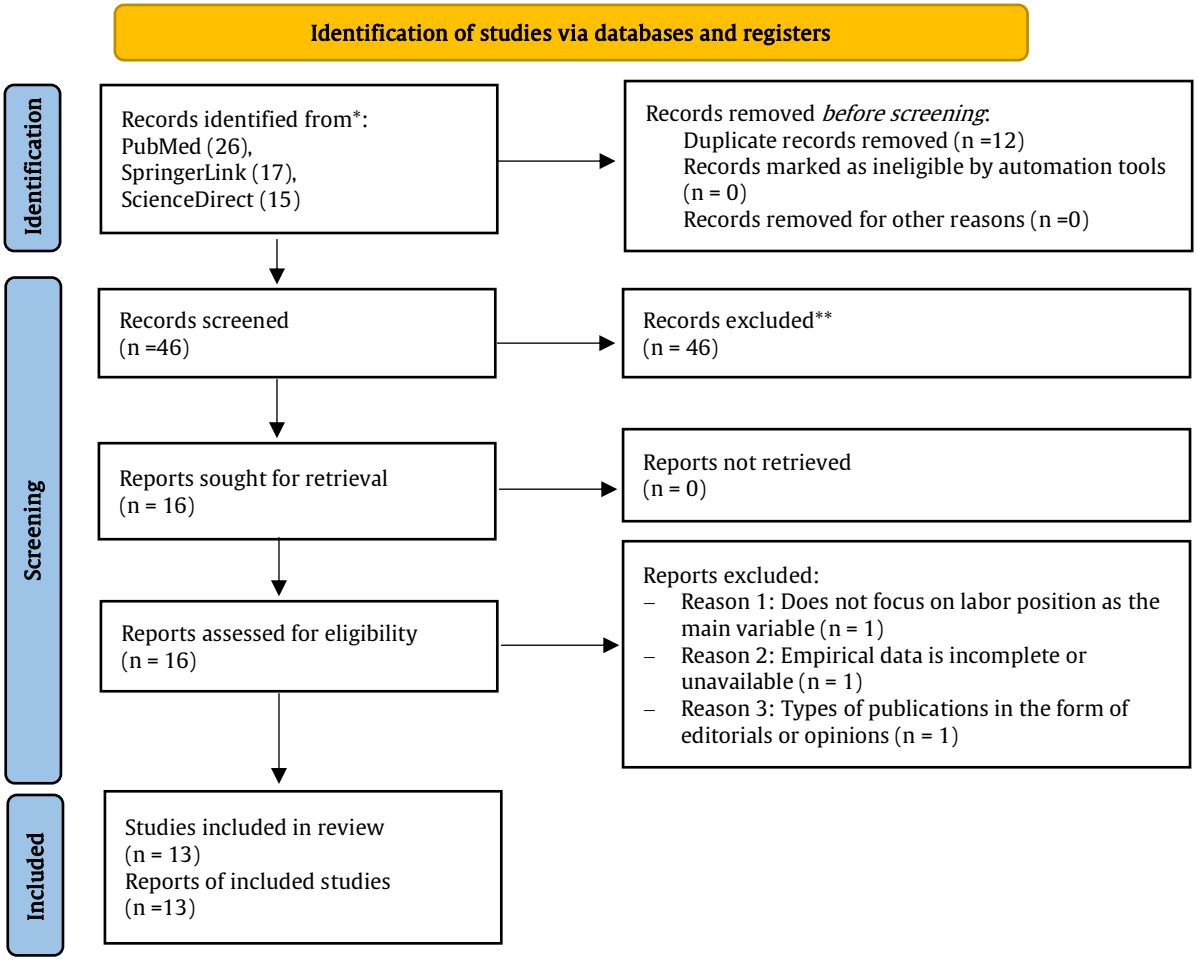
Inclusion criteria were rigorously defined to ensure methodological validity and relevance of the evidence synthesized. Specifically, quantitative studies, systematic reviews, and guidelines issued by reputable international health organizations such as the World Health Organization (WHO) that clearly addressed the impact of birthing positions on key clinical outcomes–including duration of labor, perineal trauma, postpartum hemorrhage, maternal comfort, and medical intervention needs (e.g., episiotomy, instrumental delivery)–were included. Publications were limited to those available in English or Indonesian to facilitate comprehensive analysis and interpretation.

Conversely, opinion pieces, editorials, and case reports were explicitly excluded because these forms of literature often lack empirical rigor, systematic analysis, and reproducible methodologies, potentially introducing bias and limiting generalizability (Higgins et al., 2022). This exclusion ensured that the synthesized evidence presented in this review is founded on robust empirical data, thereby enhancing the reliability and applicability of the conclusions drawn.

The selection process adhered strictly to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a widely recognized protocol designed to ensure clarity and transparency in reporting systematic reviews (Page et al., 2021). The PRISMA approach involved sequential steps including the initial identification of studies through database searching, removal of duplicates, screening of titles and abstracts for relevance, full-text review for eligibility assessment, and the final selection of studies meeting all inclusion criteria. Additionally, the quality of the selected articles was systematically evaluated using the Grading of Recommendations, Assessment,

Development, and Evaluations (GRADE) approach. The GRADE methodology enabled the categorization of evidence quality (high, moderate, low, or very low) based on considerations of study limitations, consistency, directness, precision, and risk of publication bias (Guyatt et al., 2011).

The analytical approach employed in this literature review was a narrative synthesis, selected due to the heterogeneity of study designs, outcomes, and measurement methods among the included articles. Narrative synthesis provided a structured approach for summarizing and interpreting findings from diverse methodologies, allowing a coherent and comprehensive understanding of the evidence regarding labor positions and their effects on childbirth outcomes (Popay et al., 2)



RESULTS

The findings from the reviewed studies are presented systematically according to clearly defined thematic categories: duration of labor, perineal trauma risk, maternal comfort, and medical interventions. This structured thematic approach enhances clarity and allows easy comparison of outcomes across different labor positions.

Duration of Labor

The duration of the second stage of labor significantly varies depending on the labor position adopted. Upright positions–including squatting, sitting, kneeling, and standing–have consistently demonstrated effectiveness in shortening labor duration. According to Berta et al. (2019), flexible sacrum positions (squatting, sitting, kneeling) significantly reduced the duration of labor by an average of 21 minutes compared to supine positions. Gupta et al. (2017) also supported these findings, documenting a reduction of approximately six minutes in labor duration with upright positions, although the evidence quality was rated as very low due to heterogeneity and potential biases. In contrast, Walker et al. (2018) observed longer labor durations with upright positions among women using epidural anesthesia, highlighting the significance of individual clinical conditions when evaluating labor positions.

Perineal Trauma Risk

The impact of birthing positions on perineal integrity has been extensively examined, revealing significant differences between various positions. The lateral (side-lying) position was consistently associated with optimal perineal outcomes, reducing the occurrence of trauma and the need for episiotomies. Shorten et al. (2002) reported that 66.6% of women maintained an intact perineum in the lateral position, while positions such as squatting demonstrated mixed outcomes, potentially increasing perineal injury in certain contexts. Olson et al. (1990) and De Jonge et al. (2004) corroborated the benefits of lateral and semi-sitting positions, particularly among multiparous women, emphasizing the role of parity and birth attendants in perineal trauma outcomes.

Maternal Comfort

Maternal comfort and satisfaction are crucial aspects of the childbirth experience, strongly influenced by the freedom and autonomy to choose preferred labor positions. Berta et al. (2019) and Satone & Tayade (2023) highlighted higher maternal satisfaction and comfort levels when mothers were empowered to select their labor positions. Conversely, Walker et al. (2018) indicated that upright positions might slightly reduce maternal satisfaction among women receiving epidural anesthesia, emphasizing the importance of personal preference and clinical contexts.

Medical Interventions

The reviewed studies indicate that birthing positions significantly impact the frequency of medical interventions during labor. Upright and lateral positions generally reduced the necessity for assisted deliveries and episiotomies, as demonstrated by Gupta et al. (2017), who reported moderate-quality evidence for reduced assisted deliveries (RR 0.75) and episiotomies (RR 0.75) in upright positions. However, upright positions also posed an increased risk of postpartum hemorrhage exceeding 500 mL, particularly when using a birthing chair (RR 1.48). These findings underscore the importance of tailored position selection based on individual risk assessments and clinical profiles.

To facilitate clearer and more efficient comparisons, a concise synthesis matrix (Table 1) summarizes the comparative advantages, disadvantages, and strength of evidence (GRADE) associated with each labor position.

Table 1. Comparative synthesis of labor positions based on duration of labor, perineal integrity, maternal comfort, medical interventions, and strength of evidence (GRADE).

Labor Position	Duration of Labor	Perineal Integrity	Maternal Comfort	Medical Interventions	Strength of Evidence (GRADE)
Upright (squatting, standing, kneeling)	Significantly reduced	Improved; fewer episiotomies	High satisfaction	Reduced assisted delivery; increased hemorrhage risk	Moderate
Lateral (side-lying)	Neutral to slightly reduced	Best perineal outcomes	Comfortable; good for rest	Reduced perineal trauma	Moderate
Supine/Lithotomy	Prolonged	Higher risk of trauma and episiotomy	Lower satisfaction	Higher rate of interventions	Moderate to high
Semi-sitting	Variable; generally reduced for multiparous	Reduced trauma in multiparous	Comfortable if angled properly	Mixed results; increased risk of bleeding in some cases	Low to moderate

Note: Strength of evidence rated according to the GRADE approach considering risk of bias, consistency, directness, precision, and publication bias.

DISCUSSION

The labor position is an important factor influencing the childbirth process and various related clinical outcomes, including the duration of labor, perineal integrity, maternal comfort, and the extent of required medical interventions (Gupta et al., 2017; Berta et al., 2019). Findings from this review suggest that upright positions such as standing, squatting, sitting, or kneeling provide physiological benefits by utilizing gravity, thus facilitating the acceleration of the second stage of labor, reducing labor duration, and minimizing the need for medical interventions (Satone & Tayade, 2023; Hemmerich et al., 2019). In contrast, the supine or lithotomy position is frequently associated with prolonged labor duration and an increased risk of perineal trauma (DiFranco & Curl, 2014).

Results from the study by Berta et al. (2019) indicate that upright positions significantly shortened the second stage of labor by approximately 21 minutes compared to supine positions. Similarly, Gupta et al. (2017) confirmed that upright positions reduce labor duration by around six minutes; however, the quality of evidence was rated as low due to heterogeneity among studies. Conversely, Walker et al. (2018) observed that for women receiving epidural anesthesia, upright positions might prolong labor and increase the risk of operative delivery. This underscores the importance of considering specific clinical circumstances, such as epidural anesthesia, in selecting the appropriate labor position (Walker et al., 2018; Gilder et al., 2002).

Perineal integrity is another critical aspect to consider when selecting labor positions. The lateral or side-lying position has consistently been associated with optimal perineal outcomes, characterized by lower rates of tears and episiotomies (Shorten et al., 2002; De Jonge et al., 2004). In contrast, the squatting position, although effective in expediting labor, can sometimes be associated with an increased risk of perineal trauma, especially among primiparous women without adequate positional support from healthcare providers (Shorten et al., 2002). Factors such as parity and healthcare provider experience, particularly midwives or obstetricians, significantly influence perineal integrity outcomes (Olson et al., 1990; De Jonge et al., 2004).

Besides physiological benefits, the choice of labor position is also closely related to maternal psychological comfort and overall satisfaction. Women who are provided autonomy to select their labor position have reported higher levels of satisfaction and more positive childbirth experiences (Scholten et al., 2024; Thies-Lagergren et al., 2013). Conversely, the lithotomy or supine positions are frequently criticized, not only for hindering natural labor physiology but also for reducing comfort and increasing pain perception, thereby negatively impacting maternal satisfaction with their childbirth experience (Bohren et al., 2019; DiFranco & Curl, 2014).

Although the benefits of alternative labor positions have been extensively documented, the implementation of these practices still encounters various practical barriers in

clinical settings. Key obstacles include inadequate training of healthcare providers on managing alternative labor positions and limitations in delivery room designs that do not support maternal mobility during labor (Mselle & Eustace, 2020; Glover et al., 2024). Additionally, hospital protocols and institutional policies tend to favor lithotomy positions, presenting further obstacles to everyday clinical practice (Mselle & Eustace, 2020; Fu et al., 2023). Furthermore, entrenched cultural perceptions and attitudes among both healthcare providers and patients contribute significantly to the limited routine implementation of alternative labor positions (Bohren et al., 2019).

These factors highlight the importance of continuous education and training for healthcare providers regarding the advantages of alternative labor positions and safe methods for clinical implementation (Scholten et al., 2024; Mselle & Eustace, 2020). Several studies have shown that educational interventions, such as simulation training or practical workshops on alternative labor positions, can enhance healthcare provider readiness in offering more flexible position options to patients (Thies-Lagergren et al., 2013; Glover et al., 2024).

In clinical practice, particularly for midwifery practitioners, findings from this review emphasize the significance of individualizing labor position choices based on specific clinical conditions, maternal preferences, and healthcare facility capabilities. For instance, the lateral position can be recommended for women with a high risk of perineal trauma, while upright positions may be more suitable for women not receiving epidurals and requiring expedited labor (Satone & Tayade, 2023; Gupta et al., 2017). Policies that support flexible labor position choices should be developed and communicated effectively to healthcare providers and patients, maximizing the benefits derived from evidence-based practices (WHO, 2018).

Variability in results across studies, particularly concerning epidural usage, suggests the need for further research exploring specific clinical conditions influencing the effectiveness of labor positions. Some studies indicate that the effectiveness of upright positions may vary significantly between populations with and without epidural anesthesia, suggesting that future research explicitly integrating these variables is essential for providing more accurate clinical guidance (Walker et al., 2018; Gilder et al., 2002).

In conclusion, this literature review affirms that no single labor position is universally ideal for all childbirth situations. Instead, the best approach is to provide various position options tailored to maternal preferences and specific clinical circumstances, supported by adequately trained healthcare providers and appropriate healthcare facilities. Policies supporting such flexibility will contribute significantly to enhancing maternal healthcare quality and improving maternal satisfaction with the childbirth experience.

CONCLUSIONS AND RECOMMENDATION

The literature review reveals that variations in birthing positions have a significant impact on the labor process and outcomes. Upright positions–such as standing, squatting, sitting, and kneeling utilize gravity to facilitate the descent of the fetus, shorten the second stage of labor, widen the pelvic outlet, and reduce the need for medical interventions such as cesarean sections and assisted deliveries. Among these, squatting and kneeling positions show higher effectiveness in accelerating fetal expulsion, while the lateral position helps preserve perineal integrity and reduce the risk of tearing.

However, position selection must be tailored to clinical conditions, such as the use of epidural anesthesia or the presence of postpartum hemorrhage risk, as some positions like semi-sitting may increase the likelihood of bleeding greater than 500 mL. In addition to physiological factors, maternal comfort and satisfaction are strongly influenced by the ability to choose a preferred birthing position.

Therefore, there is no single "best" position for all laboring women. Evidence-based practice recommends flexibility and individualization in position selection during childbirth. The routine use of the lithotomy position should be avoided due to its association with increased perineal trauma, maternal discomfort, and prolonged labor. Hospitals and healthcare facilities are encouraged to offer a wider range of birthing position options, allowing mothers to choose based on their comfort and clinical needs, supported by evidence of the benefits of alternative positions. Furthermore, educating pregnant women on the importance of being free to choose a comfortable birthing position is essential to promote maternal involvement in the labor process and to reduce childbirth-related anxiety.

Future research directions should prioritize longitudinal and population-based studies aimed at evaluating the long-term impacts of implementing recommended labor positions. Comprehensive longitudinal research would clarify sustained maternal health benefits, psychological impacts, and long-term satisfaction associated with routine adoption of flexible labor positions in diverse healthcare settings. Population-based studies could also elucidate variations in outcomes across different populations and healthcare systems, providing robust, generalizable data that can inform tailored clinical policies and guidelines (Renfrew et al., 2014; Walker et al., 2018).

In conclusion, integrating flexible and evidence-based labor position options into standard maternity care practice represents a critical advancement toward improving childbirth outcomes and maternal experiences. Strategic policy development, rigorous professional training, infrastructural adaptations, and targeted research investments are essential steps forward. By implementing these measures, healthcare systems can significantly enhance maternal care quality, optimize childbirth outcomes, and elevate overall maternal satisfaction.

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APPENDIX

Table 1. Characteristics based on author, year, study title, design, sample, instrument, sampling technique, variables, analysis, objectives, results and conclusions.

No	Author′s	Design, Sample, Instrument, Sampling Technique, Variables, Analysis	Objectives,	Results and Conclusions.
	Marta Berta, Helena Lindgren, Kyllike Christensson, et al. (2019)	Design: Systematic review and meta-analysis of 8 studies (6 randomized controlled trials and 2 non-randomized studies) Sample: A total of 1,985 women; 933 in the supine position group and 938 in the "flexible sacrum" position group (e.g., squatting, sitting, kneeling, etc.) Instrument: Duration of the second stage of labor (in minutes) Sampling Technique: Literature selection based on the PRISMA framework from PubMed, Scopus, and Google Scholar Variables: Birthing position ("flexible sacrum" vs. supine) and duration of the second stage of labor Analysis: Random-effects model meta-analysis; heterogeneity assessed using I^2 statistic; subgroup analysis by region; sensitivity analysis and publication bias assessed using Egger′s test	To evaluate the effect of flexible birthing positions (such as squatting, sitting, kneeling, etc.) on the duration of the second stage of labor.	The average duration of the second stage of labor was 21 minutes shorter (95% CI: 11.8–30.4 minutes) in flexible positions compared to the supine position. The effect was more pronounced in developing countries (mean difference: −18.9 minutes; I^2 = 68%) compared to developed countries (wide confidence intervals, I^2 = 98%). The analysis showed no significant publication bias. Two studies allowed women to choose their preferred birthing position, resulting in increased efficiency and greater maternal comfort. Conclusion: Flexible sacrum positions significantly shorten the second stage of labor. Women should be given the freedom to choose the position they find most comfortable.
2.	Prasiddhi D. Satone & Surekha A. Tayade (2023)	Design: Literature review of 42 studies Sample: Not specified; based on the studies included in the review Instrument: Previous studies (including randomized controlled trials, observational studies, and surveys) Sampling Technique: Literature search conducted using databases such as PubMed, Cochrane, and Google Scholar, employing MeSH terms and keyword combinations Variables: Birthing positions (upright, supine, squatting, birthing chair, kneeling, lateral, etc.) Analysis: Narrative synthesis; no statistical meta-analysis was performed	To review and compare the benefits and risks of various alternative birthing positions compared to the conventional (supine/lithotomy) position during the second stage of labor.	Upright positions (such as squatting, sitting, and kneeling) accelerate the second stage of labor and reduce the rates of episiotomy and assisted delivery, but increase the risk of blood loss greater than 500 mL when using a birthing chair. Lateral position (side-lying) yields the best outcomes for perineal integrity. Lithotomy/supine position is the most commonly used due to its convenience for healthcare providers but is associated with higher pain levels, increased episiotomy rates, and more frequent use of assisted delivery. The World Health Organization (WHO) recommends that women be given the freedom to choose the most comfortable position for labor. Studies indicate that awareness of alternative positions remains low, and practices are often dominated by the convenience of healthcare providers.

3.	Janesh K. Gupta, Akanksha Sood, G.J. Hofmeyr, Joshua P. Vogel (2017)	Design: Systematic review and meta-analysis of 32 randomized controlled trials (RCTs) Sample: 9,015 pregnant women without epidural anaesthesia from 30 RCTs Instrument: Various instruments, according to each RCT; data on duration, interventions, maternal and neonatal outcomes Sampling Technique: Randomized/quasi-randomized trials Variables: Birthing position (upright vs. supine), duration of the second stage of labor, mode of delivery, bleeding, perineal trauma, neonatal intensive care unit (NICU) admission Analysis: Meta-analysis conducted using RevMan, GRADE for evidence quality, random/fixed effects models, sensitivity analysis, and heterogeneity (I^2)	To evaluate the benefits and risks of different birthing positions (upright vs. supine) during the second stage of labor in women without epidural anesthesia.	Upright position reduces the duration of the second stage of labor by approximately 6 minutes (very low quality of evidence). Reduces the rate of assisted delivery (RR 0.75, moderate quality). Reduces the rate of episiotomy (RR 0.75). Increases the likelihood of blood loss greater than 500 mL (RR 1.48). No significant differences were found in cesarean section rates, third- or fourth-degree perineal tears, or NICU admissions. Further studies are needed due to high risk of bias and heterogeneity.
4.	Kate F. Walker, Marion Kibuka, Jim G. Thornton, Nia W. Jones (2018)	Design: Systematic review and meta-analysis of 8 randomized controlled trials (RCTs) Sample: 4,464 pregnant women with epidural anaesthesia from the United Kingdom, France, and Spain Instrument: Data on labor (duration, method, trauma, bleeding, neonatal outcomes, maternal satisfaction) Sampling Technique: Randomized/quasi-randomized trials Variables: Birthing position (upright vs. recumbent), labor outcomes (operative delivery, duration, bleeding, trauma, etc.) Analysis: RevMan, GRADE, meta-analysis with random-effects model, sensitivity analysis	To evaluate the effect of maternal body position (upright vs. recumbent) during the second stage of labor on maternal and neonatal outcomes in women with epidural anesthesia.	No significant difference in the risk of operative delivery (RR 0.86, 95% CI 0.70–1.07; low quality). The duration of the second stage was inconsistent (mean difference: 6 minutes longer; very low quality). Sensitivity analysis of high-quality studies indicated that the upright position actually increased the risk of operative delivery and cesarean section. No significant effect was found on birth trauma, bleeding, or NICU admissions. Maternal satisfaction was slightly lower in the upright position. Cord pH was better in the upright position, but the evidence quality was moderate. The lateral recumbent position (not fully supine) appears to be more beneficial based on quality scientific evidence.
5.	A. De Jonge, T.A.M. Teunissen, A.L.M. Lagro-Janssen. (2004)	Design: Meta-analysis of 9 RCTs and 1 cohort study Sample: 23 initial studies, 10 studies included (9 RCTs, 1 cohort), total sample size in the thousands of women Instrument: Clinical reports (labor duration, blood loss, type of delivery, pain experience, episiotomy, Apgar score, umbilical cord pH, etc.) Sampling Technique: Study selection based on inclusion criteria from various databases Variables: Supine vs. non-supine positions (e.g., squatting, sitting, lateral, etc.), maternal and neonatal outcomes Analysis: RevMan (Cochrane), random effects model, OR and WMD, quality analysis (Delphi), qualitative data on patient experiences	To assess whether the routine use of the supine position during the second stage of labor has benefits based on scientific evidence.	The supine position is associated with an increase in instrumental delivery (OR 1.37) and episiotomy (OR 1.73). The supine position reduces blood loss (approximately -59 mL), but its clinical significance remains unclear. No significant differences were found in Apgar scores, neonatal resuscitation, or umbilical artery pH. More women experienced severe pain and found it difficult to push in the supine position. The majority of women preferred a non-supine position for future deliveries. Conclusion: There is insufficient evidence to support the routine use of the supine position; cohort studies and qualitative methods are recommended for future research.

6.	Allison Shorten, Jacki Donsante, Brett Shorten (2002)	Design: Retrospective analytic study Sample: 2,891 normal vaginal births at a regional hospital in Australia (1998–2000) Instrument: Medical record data, labor position tables (A-F), SPSS for analysis Sampling Technique: Consecutive sampling Independent Variables: Birth position, type of accoucheur (attendant). Dependent Variables: Perineal outcomes (episiotomy, tearing, intact perineum). Analysis: Descriptive statistics, cross-tabulation, logistic regression	To assess the influence of birth position and type of accoucheur on perineal outcomes in normal vaginal deliveries.	The lateral position yields the best perineal outcomes (66.6% intact perineum), while the squatting position yields the worst outcomes (41.9%). Episiotomy is more frequently performed by obstetricians (26%) compared to midwives (approximately 5%). Midwives are more likely to achieve an intact perineum compared to obstetricians. Other factors influencing perineal outcomes include: infant birth weight, maternal age, parity, and the duration of the second stage of labor. Conclusion: The lateral position is recommended to minimize perineal trauma. Midwives demonstrate better performance in maintaining an intact perineum compared to obstetricians. An individualized approach and empowering women to choose their birth position are essential.
7.	Andrea Lemos, Melania MMR Amorim, Armele Dornelas de Andrade, Ariani I. de Souza, José E. Cabral Filho, Jailson B. Correia (2017)	Design: Cochrane Systematic Review & Meta-Analysis of 21 RCTs Sample: 3,763 women (884 for types of pushing, 2,879 for duration of pushing) Instrument: Maternal and neonatal outcomes data: duration, lacerations, Apgar scores, NICU admission, etc. Sampling Technique: RCTs & quasi-RCTs, no cross-over Variables: Type of pushing (spontaneous vs directed) and duration of pushing (immediate vs delayed), with and without epidural anesthesia Analysis: GRADE, RevMan, random/fixed effect, sensitivity analysis, and heterogeneity (I^2)	To assess the benefits and drawbacks of various pushing/breathing techniques during the second stage of labor on maternal and neonatal outcomes.	Type of pushing (spontaneous vs directed): No significant differences in the duration of the second stage, episiotomy, lacerations, or neonatal outcomes (NICU, Apgar). Duration of pushing (delayed vs immediate, in women with epidural): Delayed pushing shortens the active pushing time (~19 minutes), increases the rate of spontaneous deliveries (RR 1.07), but extends the total second stage (~56 minutes). No significant differences in severe perineal injury or NICU admission. Conclusion: There is insufficient evidence to recommend a specific pushing method; decisions should be tailored to the mother's preferences and the clinical context.

8.	R. Olson, C. Olson, N. S. Cox (1990)	Design: Retrospective observational study Sample: 335 women who gave birth vaginally between December 1980–December 1988 in a rural family doctor practice in Wisconsin, USA Instrument: Medical record data Sampling Technique: Total sampling from the practice population Variables: Birthing positions (semi-sitting, lithotomy, birthing chair, lateral) and perineal outcomes (intact, episiotomy, laceration) Analysis: Statistical analysis to examine the relationship between birthing positions and perineal outcomes, with stratification based on parity	Evaluating the Relationship Between Maternal Birthing Positions and Perineal Injury	Position Usage: 44% of women gave birth in the semi-sitting position, 28% in the lithotomy position, 24% in the birthing chair, and less than 5% in the lateral position. Perineal Outcomes: Nearly 30% of women delivered with an intact perineum; 44% of women had an episiotomy. Primiparous Women: No significant relationship was found between birthing position and perineal outcomes for primiparous women. Multiparous Women: A significant relationship was found for multiparous women. Those who delivered in a birthing bed were less likely to experience perineal trauma compared to those who delivered on an exam table. Conclusion: Birthing position affects perineal outcomes in multiparous women, with the semi-sitting position in a birthing bed associated with less perineal trauma. No significant effect of birthing position on perineal outcomes for primiparous women.
9.	Joyce T. DiFranco & Marilyn Curl (2014)	Design: Evidence-based practice review article. Sample: Previous studies and data from the Listening to Mothers surveys I-III. Instruments: Scientific literature, national surveys on childbirth experiences, references from Cochrane, and ACOG (American College of Obstetricians and Gynecologists). Sampling Technique: Narrative synthesis of literature and national survey data. Variables: Birth position (supine vs upright), pushing technique (spontaneous vs directed), duration of the second stage of labor. Analysis: Narrative synthesis of clinical practice vs. research evidence.	Presenting evidence that upright positions and spontaneous pushing better support a safe and efficient physiological birth	Upright positions (squatting, standing, side-lying, kneeling) utilize gravity and increase pelvic size. Spontaneous pushing (based on the body's urge) is better than directed pushing (Valsalva), which can decrease maternal oxygen, trigger fetal stress, and increase perineal trauma. Directed pushing shortens the second stage of labor by an average of only 13 minutes, which is not clinically significant. Studies show that the supine position is dominant in hospitals, although it offers no benefits and actually increases the likelihood of interventions. Recommendations: allow freedom of position, delay active pushing until the natural urge occurs, and provide continuous support during labor.
10.	A. L. Zimerman, M. Moskovich, E. B. Levi, R. Maymon, J. Tobvin, M. Betser (2018)	Design: Quantitative observational study Sample: 50 nulliparous women with full-term pregnancies (>37 weeks) in the second stage of labor with occipitoanterior fetal presentation Instrument: Transperineal ultrasound, angle measurement (goniometer), standard labor bed Sampling Technique: Not explicitly stated (likely consecutive sampling) Variables: Femoropelvic angle (FPA) and angle of progression (AoP) Analysis: Statistical analysis with significance testing ($P < 0.001$), Pearson correlation	To assess the effect of the McRoberts maneuver (maternal hip hyperflexion) on the fetal head angle of progression (AoP) during the second stage of labor.	The McRoberts maneuver significantly increases the AoP. The median AoP increased from 113° (FPA −10°) to 132° (FPA >135°). Maternal position changes affect the AoP values. AoP measurement should be standardized with a specific maternal position for accurate results.

11.	Andrea Hemmerich, Teresa Bandrowska, Geneviève A. Dumas. (2019)	Design: Biomechanical computational simulation with a 3D pelvis model Sample: One primiparous female pelvis model based on MRI (non-pregnant); simulations of pregnant and non-pregnant conditions. Instruments: RecurDyn and Visual3D software, tracking of pelvic anatomical landmarks during squatting movement. Sampling Technique: No direct human subjects; based on MRI model and joint load data from previous studies. Variables: Ligament conditions (normal vs pregnant), squatting position, joint moments, changes in pelvic dimensions (diameter and area of inlet, midplane, outlet). Analysis: Comparison of pelvic diameter and area changes between pregnant vs non-pregnant conditions, as well as dynamic load vs final position.	To evaluate how the squatting position and increased ligament laxity during pregnancy affect changes in pelvic dimensions during childbirth.	Squatting during pregnancy results in an increase in the pelvic outlet diameter: +6.1 mm (AP) and +11 mm (transversal), compared to +4.1 mm and +2.6 mm for non-pregnant conditions. The greatest increase occurs during movement, not when in a stationary position. The pelvic outlet area increases significantly (doubling in the pregnant simulation compared to non-pregnant). Looser ligaments during pregnancy allow for more pelvic bone rotation. The squatting position helps open the birth canal through the lumbosacral and hip joint moments that pull the sacrum outward. Clinical implications: Mobility during labor and upright positions like squatting can help biomechanically widen the birth canal.
12.	J.G.B. Russell (1969)	Design: Retrospective radiological observational study Sample: 96 pregnant women in the third trimester and 47 postpartum women Instrument: Pelvic X-ray images (outlet, lateral, AP), Hartley technique for measuring bispinous diameter Sampling Technique: Review of pelvimetry radiography archives Variables: Body position (supine vs sitting), bispinous diameter Analysis: Comparison of mean diameters, statistical distribution, significant differences between groups	To assess how changes in body position affect pelvic outlet dimensions during pregnancy and postpartum.	In pregnant women, changing from a supine to a sitting position increases the average bispinous diameter by 7.6 mm (SD 3.5 mm). In postpartum women, the increase is only 0.9 mm (SD 1.2 mm). Position changes lead to sacral rotation and sacroiliac joint movement, expanding the pelvic outlet without joint dislocation. Squatting is thought to be the most optimal position for enlarging the outlet due to maximal leverage from the femur. Conclusion: Pelvic moulding occurs through a complex postural mechanism, not through actual pelvic joint separation.
13.	Lilian Teddy Mselle & Lucia Eustace (2020)	Design: Qualitative descriptive Sample: 23 participants (16 postnatal mothers & 7 midwives), selected purposively Instrument: Semi-structured interview guide & focus group discussion (FGD) Sampling Technique: Purposive sampling Variables: Perceptions and experiences of birthing positions Analysis: Inductive qualitative content analysis	Exploring the perceptions and experiences of postnatal mothers and midwives regarding the use of the lithotomy/supine position during childbirth.	Women in labor generally adopt the supine position because they are directed to do so by midwives. Midwives believe the supine position is the best and most familiar. No education or alternative birthing positions are offered to the mothers. The birthing position is chosen by the midwife, not the mother. Conclusion: The choice of birthing position is still largely dominated by midwives and medical practice culture. A maternity care approach that respects women's choices and autonomy is needed. Education about various birthing positions for both healthcare providers and mothers is essential.