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INFLUENCE AND MEANING OF THE HOSPITAL BIRTH ENVIRONMENT ON THE LABOUR EXPERIENCES OF NULLIPAROUS WOMEN: A SYSTEMATIC REVIEW.

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Abstract

Aim: This systematic literature review explores how hospital environment influence the labour experiences of nulliparous women (first-time mothers). By synthesizing literature from 1989-2024, the study aims to provide insight into shaping better maternal care within teaching hospital settings. **Methodology:** The researcher utilized PICO framework to search PubMed, Google Scholar, and Scopus. The key focus areas included: Population: Nulliparous women. Intervention: Hospital-based birth environment. Comparison: Traditional birth Outcome: Influence on maternal health experiences. Inclusion criteria focused on peer-reviewed, English-language studies, including randomized controlled trials (RCTs) and observational studies. **Results:** The data reveals a significant surge in research interest over the last five years, with 2019 and 2022 representing the peaks of academic inquiry (27.8% each). Positive experiences were strongly linked to supportive interactions with healthcare providers, physical comfort and emotional support, however, negative experiences were associated with high levels of medical intervention, excessive interventions, lack of and rigid hospital protocols. **Conclusion:** The birth environment is a critical determinant of labour outcomes and psychological experience of the first-time mothers. While Western studies provide strong foundation, the review concludes that healthcare providers must foster more supportive and holistic environment globally. A notable gap exists in the literature regarding Sub-Sahara Africa, suggesting a dire need for localized studies in diverse cultural contexts, however, improving the physical and sensory aspect of hospital wards can lead to superior maternal and neonatal health outcomes.

Keywords: Influence and meaning, Nulliparous women, Hospital-based birth environment, Labour experience, Maternal Health Care.

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INTRODUCTION

Childbirth is a significant milestone in the life of women and their families. It is often marked by emotional, physical and psychological transitions, Goldkuhl, Dellenborg, Berg, Wijk & Nilsson (2022). The importance of childbirth has led to its widely accepted global definition as the process through which a baby is delivered after labour, involving a complex interplay of biological, psychological, and social processes**;** culmnating in the emergence of a neonate from the maternal uterus (World Health Organization, 1996; The Royal Australian and New Zealand College of Obstetricians and Gynaecologists, 2022). The process of childbirth is complex, involving stages of labour, which are influenced by various maternal and fetal factors, including the birth environment, (Mendelson et al., 2017). For nulliparous (first-time-birth) women, the birth experience is especially profound, shaping perceptions of motherhood, self, and healthcare. The implications of nulliparous childbirth for maternal and neonatal healthcare highlight the importance of quality childbirth care in preventing maternal and neonatal morbidity and mortality (United Nations, 2020).

The birth environment plays a significant role in shaping the labour and birth experience of nulliparous women. The physical, emotional, and psychological aspects of the environment interact to influence labour outcomes and the overall birth experience (Nielsen & Overgaard 2020). This conceptual framework draws upon the Ecological Model of Childbirth and the Biopsychosocial to understand the dynamic relationship between the birth environment and its influence on nulliparous women in a hospital-based labour setting.

Research indicates that nulliparous women face higher risk of adverse birth outcomes compared to multiparous women. Nulliparous women have increased odds of perinatal mortality, stillbirth, and small for gestational age infants at term (Devabhaktuni et al., 2021). These disparities may partly arise because high-risk nulliparous women are less likely to experience subsequent live births (Miranda et al., 2011).

Nulliparous women aged 35 and older are at greater risk for various pregnancy complications, including hypertension, preterm labor, and cesarean births, compared to younger nulliparous women (Ziadeh, 2002). Despite these risks, perinatal death rates were similar between older and younger nulliparous women (Ziadeh, 2002). Regarding contraception, intrauterine devices (IUDs) are equally safe and effective for both nulliparous and parous women, with similar reasons for removal in both groups (Lete et al., 1998).

These findings suggest that nulliparous women may require increased surveillance during pregnancy and childbirth.

In Western countries, childbirth practices have increasingly focused on the integration of evidence-based care with respect for women's autonomy and preferences **(**Goldkuhl, Gyllensten, Begley, Nilsson, Wijk, Lindahl, Uvnäs-Moberg & Berg, 2023). Many hospitals now provide labour rooms designed to offer a home-like setting, allowing for more natural births while maintaining access to advanced medical care when necessary (Davis-Floyd, 2001). Midwifery-led models of care, where women are supported by a known caregiver, have also gained prominence, contributing to positive birth outcomes (Renfrew et al., 2014). Childbirth care in Africa varies significantly depending on the region, healthcare infrastructure, and cultural norms. In many areas, women face significant barriers to accessing quality maternity care, including inadequate healthcare facilities, shortage of skilled healthcare providers, and traditional beliefs that influence birthing practices (Lawn et al., 2009). However, efforts to improve maternal care in Africa have led to increased utilization of healthcare facilities for childbirth, although much remains to be done to ensure that these environments are conducive to safe and respectful maternity care. In Africa, childbirth care is often compromised by inadequate infrastructure, limited resources, and cultural barriers (Moyer et al., 2013). Specifically, in Nigeria, maternal mortality ratios remain high, with 615 deaths per 100,000 live births (National Bureau of Statistics, 2020). This high maternal mortality ratio in Nigeria is attributable to traditional birth practices still existing in several rural and semi-urban places in Nigeria. Traditional childbirth practices remain prevalent alongside contemporary hospital-based maternity services, demonstrating the significant role of cultural beliefs and customs in shaping childbirth experiences among the Igbo communities of southeastern

Nigeria (Ohaja & Murphy-Lawless, 2017).

Traditional birth practices remain an important aspect of maternal care in many Nigerian communities, where women often depend on family members and traditional birth attendants (TBAs) for support during labour and childbirth. However, there has been a gradual increase in hospital-based deliveries due to growing awareness of the benefits of skilled maternity care. The choice of birthplace is commonly influenced by social, economic, and cultural factors. Many women prefer hospital deliveries because they are perceived to be safer, although concerns still exist regarding the impersonal nature of the hospital environment and the limited emotional support available during labour (Izugbara & Ukwayi, 2003).

In many states of Nigeria, for instance Abia State, childbirth practices differ between rural and urban communities. Urban women are more likely to utilize hospital maternity services in both public and private healthcare facilities. Despite this increase in hospital utilization, the quality of maternity care in some teaching hospitals, including Abia State University Teaching Hospital, may be affected by overcrowding, inadequate staffing, and limited healthcare resources (Okafor et al., 2020). Consequently, some women express dissatisfaction with hospital-based childbirth experiences, particularly regarding the lack of emotional and psychological support during labour.

The research questions of this systematic literature review are:

i. What are the perceptions of nulliparous women on the safety, comfort and overall birth outcomes?

ii. How does the birth environment influence/affect the labour and delivery experience of nulliparous women?

iii. What factors in the birth environment contribute to a positive or negative childbirth experience?

iv. What is the difference between traditional birth environment and hospital-based birth environment?

These four research questions give holistic coverage of the PICO (Population, Intervention, Comparison, Outcome) domains for this topic. The population is nulliparous women, intervention is hospital-based birth environment, comparison is traditional birth environment and the outcome is influence on the experience of nulliparous women.

Despite the growing awareness of the importance of the birth environment in the Western developed countries, there is low empirical evidence of research specifically addressing the experiences of nulliparous women in the Sub-Saharan Africa. This systematic literature review seeks to explore how the birth environment in a teaching hospital influences the experiences and outcomes of first-time mothers.

This systematic literature will assist in gathering all existing body of knowledge in birth environment so as to understand how hospital-based birth environments affect the childbirth experiences of nulliparous women. It will also reveal how this area of midwifery has been explored in the global, Western countries, African and Nigerian contexts. The findings from this study will inform us on the gap in the literature for further studies.

METHODOLOGY

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guideline was followed in writing this systematic review.

Databases used, search date and Search strategy for the study

The search for relevant studies was conducted in three primary databases: PubMed (Platform: National Center for Biotechnology Information), Google Scholar (Platform: Google), and Scopus (Platform: Elsevier). The search was initially conducted in PubMed using Medical Subject Headings (MeSH) terms. The MeSH terms were developed using the PICO framework. These MeSH terms were then modified to suit the search in other databases covering from January 1989 to October 2024. The last search in all databases was conducted on October 14, 2024.

The suggested key terms for **PICO** include:

1. **Search to identify the Population (nulliparous women)** The following terms were searched: “Nulliparous women” OR Nulliparity OR “First-time mothers” OR “Women with no prior childbirth” OR “Primiparous women” OR “Pregnant for the first time” OR “First pregnancy” OR “Childbearing for the first time” OR “No previous deliveries” OR “Uniparous women” OR Primigravida OR “Women without childbirth history” OR “First labor” OR “Women experiencing first birth” OR “Newly pregnant women” OR “First-time expectant mothers” OR “Women in initial pregnancy” OR Primiparity OR “Pregnancy without previous birth” OR “Women in early childbirth stage” OR “First-time laboring women”

2. **Search to identify intervention (hospital-based birth environment).** The following terms were searched: Hospital birth center* OR Centers, Hospital Birthing OR Hospital Birthing Centers OR Birthing Centers Hospital OR Birthing Centers Hospital OR Delivery Room OR Room, Delivery OR Rooms, Delivery OR Birth Centers, Hospital OR Birth Center, Hospital OR Hospital Birth Center OR Hospital Birth Center* OR Center, Hospital Birth* OR Birthing Center, Hospital OR Hospital Birthing Center OR Centers, Hospital Birth OR Hospital Birth Setting OR Labor and Delivery Room OR Maternity Ward Environment OR Obstetric Unit Design OR Birth Environment Factors OR Perinatal Care Setting OR Medicalized Birth OR Supportive Birth Environment OR Hospital-Based Labor Experience OR Maternal Comfort in Hospital OR Birth Facility Atmosphere OR Patient-Centered Maternity Care OR Environmental Influences on Birth OR Physical Space in Labor Units OR Hospital Infrastructure for Childbirth OR Clinical Birth Environment OR Birth Room Layout OR Neonatal Care Setting OR Labor Support Spaces OR Hospital Birth Services

3. **Search to identify the Comparison (traditional birth environment**) The following keywords were searched: traditional birth environment OR Home birth OR Natural birth setting OR Cultural birthing practices OR Traditional midwifery OR Non-medical birth environment OR Community-based birth OR Indigenous birth practices OR Non-hospital birth OR Customary birth rituals OR Ancestral birthing methods OR Rural birth practices OR Culturally-rooted childbirth OR Traditional labor setting OR Unassisted birth OR Midwife-led birth environment OR Low-intervention birth setting

4. **Search to identify Outcome (Influence, perception, meaning).** The following keywords were searched: Influence OR Impact OR Effect OR Role OR Contribution OR Significance OR Determinant OR Correlation OR Relationship OR Causation OR Mediator OR Modifier OR Driver OR Factor OR Interaction OR Catalyst OR Shaping OR Guidance OR Pressure OR Control OR Persuasion OR Perceptions OR Awareness OR Belief OR Understanding OR Interpretation OR Viewpoint OR Attitude OR Opinion OR Cognition OR Insight OR Recognition OR Perspective OR Conception OR Judgment OR Experience OR Evaluation OR Meaning OR Significance OR Interpretation OR Value OR Purpose OR Implication OR Understanding OR Sense OR Connotation OR Essence OR Explanation OR Relevance OR Definition OR Conceptualization OR Insight OR Representation OR Notion OR experience* OR Encounter OR Perception OR Interaction OR Involvement OR Engagement OR Exposure OR Understanding OR Insight OR Knowledge OR Awareness OR Practice OR Observation OR Familiarity OR Learning OR Perspective OR Journey OR Participation

To ensure a comprehensive search, all fields (which include grey literature and cross-referencing of bibliographies) were used in PubMed search. The above keywords used were finetuned using the AND and OR Boolean operators. All the other databases were searched using a similar set of keywords.

Study Screening and selection

The papers extracted were entered into Mendeley Reference Manager, with duplicates removed using both software and manual review. Finally, the full text of the remaining articles was examined to

determine whether articles were included in the final study.

Screening for eligible papers was done in three stages.

In the first stage, titles and abstracts of search results were screened for relevance.

In the second phase, relevant papers were screened for full-text records, and reference lists of full-text records were further searched for other relevant papers.

In the third phase of the screening process, reviewed papers were screened and added based on the eligibility criteria. The details of the information are shown in PRISMA flow diagram of Figure 1.

Eligibility criteria: inclusion and exclusion criteria for the review

Inclusion

1. Papers conducted using study designs such as randomised controlled trials, cohort/longitudinal studies, cross-sectional surveys, qualitative designs, mixed-method designs, case–control designs, etc.
2. Papers that sampled hospital-based birth environment and nulliparous women and their similar key terms were included.
3. Grey literature (dissertation or thesis).
4. Papers published in the English language.
5. All reviewed studies

Exclusion

1. Papers that did not report on hospital-based birth environment and nulliparous women.
2. Letters to editors, conference papers, preprint, opinions, manuscripts, abstracts, and pre-proofs.
3. Studies conducted in any other language apart from the English language.

Results Search outcome and selection of studies

1. Records identified from PubMed, Google Scholar, Scopus were 103 articles.
2. Records removed before screening including duplicate records removed were 34
3. Records marked as ineligible by automation tools were 31.
4. Records screened were 39.
5. Records excluded were 64
6. Reports sought for retrieval were 39.
7. Reports assessed for eligibility were 39.
8. In all, 18 records were included in this synthesis, and 85 records were excluded based on the eligibility criteria.

Appraisal of studies (Quality Assessment)

Briggs's critical appraisal tools, developed and updated by Joanna Briggs Institute (JBI) in 2020 were used to appraise included studies. The aim was to certify all reviewed studies and to report the quality of all included studies for readership. This tool comprises checklists for evaluating the quality of qualitative studies, cross-sectional studies, randomised controlled trials, etc. Mixed Method Appraisal Tool (MMAT) version 2018 was used to appraise all included mixed-method studies. The scoring procedures were used in grading the included studies.

RESULTS

Data Synthesis and Extraction

Data extraction was performed through the use of a data extraction table developed in Microsoft Excel. The table consists of author, study title, publication year, country of study origin, aim of the study, design and setting, sample size, intervention, measurement, and main findings. Next, the results of the included studies in the review were scrutinized and appropriate categories were created based on the study aims, and differences and similarities in their findings. Eighteen (18) articles were finally extracted for this systematic literature review.

Characteristics of included studies

The characteristics of the extracted data that were included are authors, year of publication, country of study, research objective, research method used, sample size, key findings, conclusion, limitation.

Several factors in the birth environment were identified as contributing to either positive or negative childbirth experiences for nulliparous women. Positive experiences were strongly linked to factors such as:

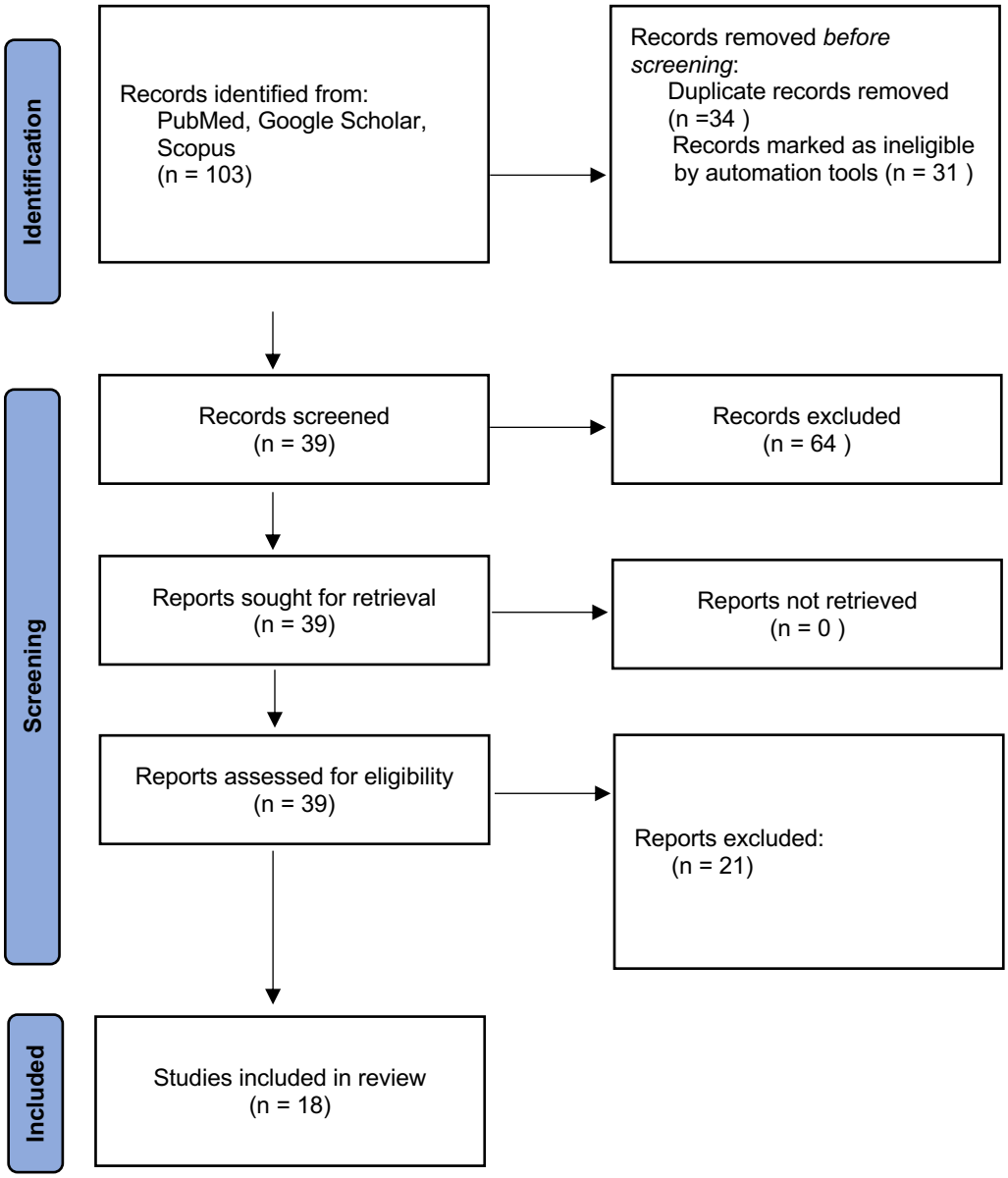

Figure 1. PRISMA flow diagram of birth environment for nulliparous women

1. Supportive Interactions with Healthcare Providers: Women who received continuous support, clear communication, and compassionate care from midwives and nurses reported greater satisfaction with their childbirth experience.
2. Physical Comfort: Elements like adjustable lighting, comfortable beds, and access to birthing aids (e.g., birthing balls, showers) were crucial in creating a conducive environment that allowed women to focus on their labour.
3. Emotional Support: Emotional reassurance from healthcare providers, partners, or family members present during labour significantly contributed to a positive experience, reducing feelings of isolation and fear.

On the other hand, negative experiences were associated with:

1. High Levels of Medical Intervention: Excessive interventions, such as the use of

synthetic oxytocin or epidurals without adequate information or consent, led to feelings of disempowerment among nulliparous women.

2. Lack of Privacy: Inadequate privacy during labor, noisy settings, and the presence of unfamiliar staff were identified as factors that increased anxiety and discomfort.
3. Rigid Hospital Protocols: Strict adherence to hospital routines that did not consider the individual needs or preferences of the woman often resulted in a negative experience, highlighting the need for more patient-centered care practices.

The comparison between traditional birth environments (such as home births or midwife-led settings) and hospital-based environments revealed distinct differences in how these settings influence nulliparous women's experiences. Traditional environments were often perceived as more natural, personalized, and supportive, with a focus on minimizing medical interventions. Women who birthed in traditional settings reported a stronger sense of autonomy, control, and comfort. In contrast, hospital-based environments were sometimes viewed as overly medicalized and impersonal. However, when hospitals incorporated elements of traditional care—such as allowing mobility during labor, offering non-pharmacological pain relief options, and creating a calming atmosphere—women experienced a more positive and empowering birth process. This finding suggests that blending the supportive aspects of traditional birth environments with the safety of medical care in hospitals may enhance childbirth experiences for nulliparous women.

Data Analysis

The frequency distribution analysis of the selected studies analysed using SPSS (Version 27) for the year of publication and country studied are given in Figure 2 and Figure 3 below.

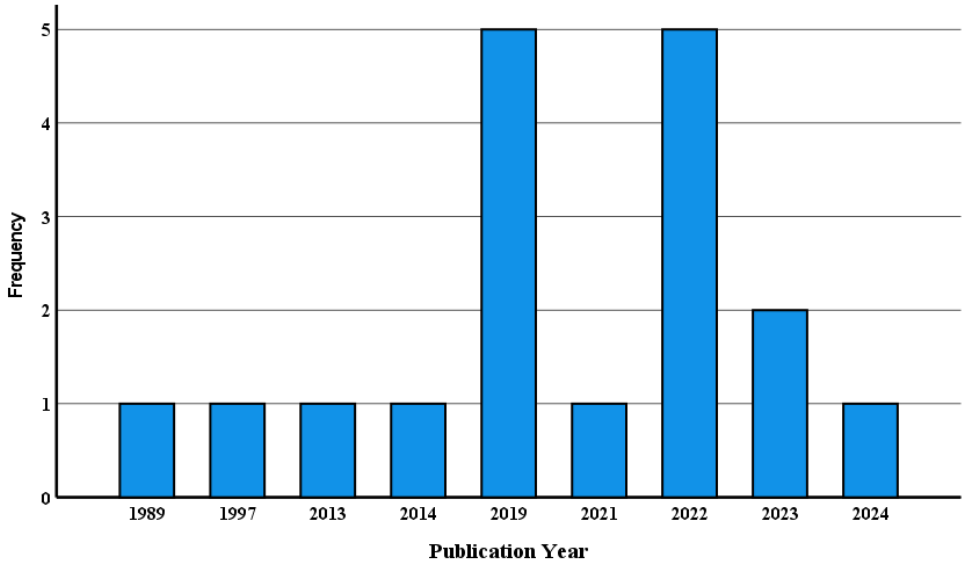

Figure 2: Distribution of Publication year from 1986 to 2024

Figure 2 examines studies published between 1989 and 2024. The distribution of studies across the years shows a varied research interest, with notable peaks in 2019 and 2022, where each year accounted for 27.8% of the total studies reviewed. Other years, such as 1989, 1997, 2013, 2014, 2021, and 2024, each contributed 5.6% of the studies. The year 2023 saw a moderate contribution of 11.1%. These trends suggest a resurgence of interest in this topic in recent years, particularly in 2019 and 2022, highlighting an increasing focus on understanding the impact of the birth environment on first-time mothers during hospital-based labour.

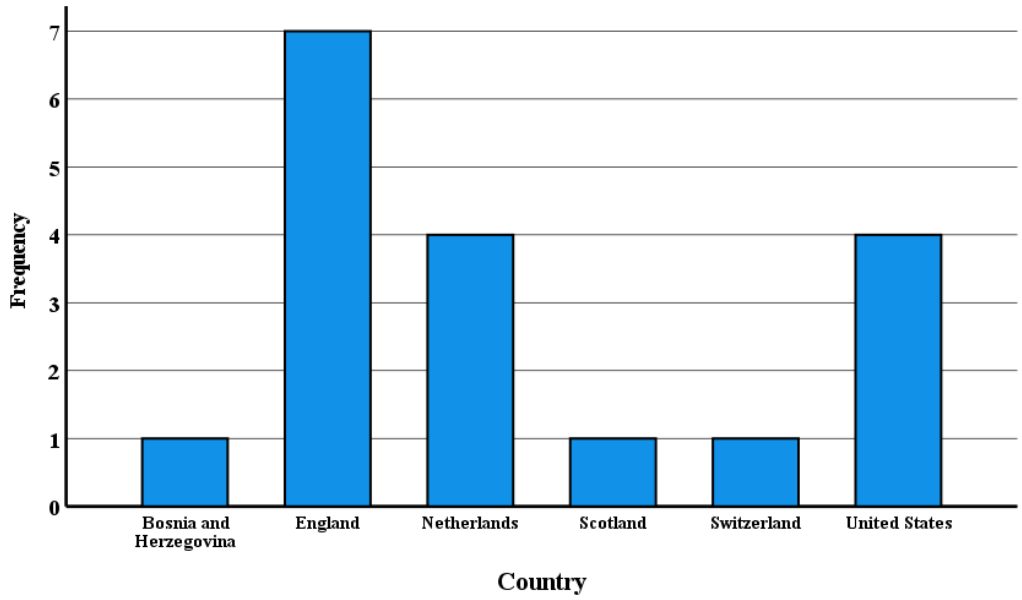

Figure 3: Geographical distribution of research studies across countries

The majority of the studies were conducted in England, accounting for 38.9% of the total. The Netherlands and the United States each contributed 22.2% of the studies. Other countries, including Bosnia and Herzegovina, Scotland, and Switzerland, each represented 5.6% of the studies. This distribution indicates a concentrated focus on this topic in England, with notable contributions from the Netherlands and the United States, suggesting regional differences in research interest and emphasis on the birth environment's influence on first-time mothers in hospital settings.

DISCUSSION

The findings of this systematic review highlight the significant influence of the birth environment on the experiences of nulliparous women during hospital-based labor. By analyzing studies published between 1989 and 2024, this review aimed to understand how various factors in the birth environment impact first-time mothers' perceptions, labour experiences, and overall birth outcomes. The discussion is organized according to the key research questions and themes identified during the review process.

The perceptions of nulliparous women regarding the birth environment are shaped by a combination of physical, emotional, and psychological factors. The reviewed studies indicate that first-time mothers' attitudes towards their surroundings can significantly influence their sense of comfort, safety, and control during labor. Women who felt that the hospital environment was supportive and welcoming reported a more positive outlook on the birthing process, while those who perceived it as cold, clinical, or uninviting experienced increased stress and anxiety.

This aligns with the Ecological Model of Childbirth and the Biopsychosocial Model, which suggest that a supportive birth environment contributes to better mental and emotional well-being during labor. These perceptions highlight the importance of creating a birth setting that fosters a sense of empowerment and reduces the fear often associated with first-time births.

The birth environment's influence on labour and delivery outcomes for nulliparous women was a central focus of this review. The evidence suggests that a well-designed hospital-based birth environment that emphasizes maternal comfort, personalized care, and minimal medical interventions can lead to more positive labor experiences. Key aspects such as the presence of supportive staff, privacy, adequate lighting, and the

ability to move freely were identified as factors that enhanced women's experiences.

Studies indicated that when nulliparous women felt in control and supported by healthcare professionals, they were more likely to have a smoother labor experience and a lower incidence of interventions like cesarean sections. Conversely, highly medicalized environments with limited maternal input were associated with increased stress, prolonged labor, and higher rates of intervention, reinforcing the need for a more holistic approach to hospital-based maternity care.

The majority of studies included in this review were conducted in Western countries, with England, the Netherlands, and the United States showing the highest concentration of research. This regional focus indicates a strong interest in understanding the birth environment's impact on nulliparous women in these developed settings. However, there was a noticeable gap in research from Sub-Saharan Africa and other low-resource regions, where the influence of the birth environment on first-time mothers remain underexplored.

The lack of studies from these regions highlights the need for more research on how cultural, socioeconomic, and healthcare infrastructure differences shape the experiences of nulliparous women in non-Western contexts, particularly Africa. Understanding these regional variations is crucial for developing globally relevant strategies to improve childbirth experiences and outcomes.

The analysis of research trends indicated that interest in the influence of the birth environment on nulliparous women has grown significantly in recent years, with notable peaks in 2019 and 2022. This resurgence suggests an increasing recognition of the importance of the birth environment in shaping labor experiences and outcomes. The heightened research focus during these years may be attributed to a broader shift towards patient-centered care and an emphasis on optimizing maternal health outcomes.

Implications for Practice and Future Research

The findings of this systematic review underscore the need for healthcare systems to prioritize the creation of supportive, patient-centered birth environments, particularly for nulliparous women who are more vulnerable to negative birth experiences. Hospitals should aim to integrate elements of traditional birth settings into their practices to promote a more holistic approach to childbirth.

Future research should focus on exploring the experiences of nulliparous women in diverse cultural settings, particularly in low-resource countries, to address the existing gaps in the literature. There is also a need for longitudinal studies that examine the long-term effects of the birth environment on maternal and neonatal outcomes to provide deeper insights into the role of environmental factors in shaping childbirth experiences.

CONCLUSION

This systematic review highlights the critical role that the birth environment plays in influencing the experiences and outcomes of nulliparous women during hospital-based labour.

Positive experiences were strongly linked to supportive interactions with healthcare providers, physical comfort and emotional support, however, negative experiences were associated with high levels of medical intervention, excessive interventions, lack of and rigid hospital protocols.

While significant progress has been made in understanding these dynamics in Western contexts, more research is needed in diverse geographic and cultural settings. By fostering supportive and holistic birth environments, healthcare providers can significantly enhance the experiences of first-time mothers, leading to better maternal and neonatal health outcomes.

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CONFLICT OF INTEREST

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