Factors influencing the implementation of non-essential interventions during normal labor based on the Consolidated Framework for Implementation Research: A post-print qualitative study

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Abstract

Background: The implementation of non-essential interventions in normal labor severely restricts the standardized and effective development of normal childbirth, leading to a waste of medical resources and hindering the improvement of maternal and infant health. Currently, there is a lack of comprehensive exploration regarding its influencing factors. Objective: To analyze the influencing factors of the implementation of non-essential interventions in normal labor based on the Consolidated Framework for Implementation Research (CFIR), providing a reference for promoting the standardized practice of normal childbirth. Methods: A descriptive qualitative research method was adopted. An interview outline was developed based on the CFIR, and semi-structured interviews were conducted with 15 midwives. Data analysis was performed using thematic analysis. Results: Based on the CFIR, a total of 4 facilitators (leadership guidance, quality control standards, childbirth-related guidelines, and positive mass media publicity), 3 barriers (outdated concepts and habits of implementers, insufficient maternal labor force, and inadequate midwifery human resources), and 4 neutral factors (the role of interventions, shared decision-making among multiple parties, maternal-centered philosophy, and maternal needs assessment) were identified as influencing the implementation of non-essential interventions in normal labor. Conclusion: The implementation of non-essential interventions in normal labor is influenced by numerous factors, requiring a focus on facilitators and barriers. Excessive childbirth interventions can be addressed by leveraging the driving role of leadership, promoting the translation and application of childbirth guidelines, disseminating correct information on childbirth interventions, strictly implementing quality control standards, actively responding to insufficient labor force, updating midwifery concepts and habits, and

strengthening the management of midwifery human resources. These measures will promote the standardization of normal childbirth, improve the quality of delivery services, and enhance maternal and infant health levels.

Full Text

Preamble

Factors Influencing the Implementation of Non-Essential Interventions During Normal Labor Based on the Consolidated Framework for Implementation Research: A Qualitative Study

Abstract

Objective: To explore the factors influencing the implementation of non-essential clinical interventions during normal labor from the perspective of healthcare providers, utilizing the Consolidated Framework for Implementation Research (CFIR). This study aims to provide a theoretical basis and practical reference for reducing non-essential interventions and promoting natural childbirth.

Methods: Using a purposive sampling method, semi-structured interviews were conducted with 15 obstetricians and midwives from three tertiary hospitals in a specific province. The interview data were analyzed using the framework analysis method, guided by the five domains of the CFIR: intervention characteristics, outer setting, inner setting, characteristics of individuals, and process.

Results: The implementation of non-essential interventions in normal labor is influenced by multiple factors. Key factors include the perceived complexity and relative advantage of the intervention (Intervention Characteristics); national policies, clinical guidelines, and patient needs (Outer Setting); organizational culture, resource availability, and communication mechanisms within the hospital (Inner Setting); the professional knowledge, clinical experience, and risk perception of healthcare providers (Characteristics of Individuals); and the planning, execution, and evaluation of clinical practices (Process).

Conclusion: Reducing non-essential interventions in normal labor requires a multi-faceted approach. It is essential to optimize clinical pathways, strengthen the training of healthcare professionals, improve the hospital' s internal safety culture, and enhance communication between doctors and patients. By addressing these factors across different domains of the CFIR, healthcare systems can better support evidence-based practices and improve maternal and neonatal outcomes.

Introduction

Normal labor is a physiological process, yet the increasing medicalization of childbirth has led to the widespread use of non-essential interventions, such as routine episiotomy, continuous electronic fetal monitoring for low-risk women, and unnecessary oxytocin augmentation. While these interventions can be life-saving in high-risk scenarios, their routine application in normal labor may lead to adverse physical and psychological outcomes for mothers and infants.

The World Health Organization (WHO) emphasizes the importance of a positive childbirth experience, advocating for reduced medical interference in spontaneous labor. However, translating these evidence-based guidelines into clinical practice remains a significant challenge. Understanding the barriers and facilitators to de-implementing non-essential interventions is crucial for improving obstetric care quality. This study employs the Consolidated Framework for Implementation Research (CFIR) to systematically identify the determinants

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背景

The implementation of unnecessary interventions during normal labor significantly restricts the standardized and effective practice of natural childbirth. Such practices lead to a waste of medical resources and hinder the improvement of maternal and neonatal health outcomes. Currently, there is a lack of comprehensive exploration regarding the factors influencing these interventions.

This study analyzes the factors influencing the implementation of unnecessary interventions during normal labor based on the Consolidated Framework for Implementation Research (CFIR). The objective is to provide a reference for promoting the standardized implementation of normal labor practices.

方法

Using a purposive sampling method, 15 midwives were recruited from the Tianjin Central Hospital of Gynecology and Obstetrics and the Second Hospital of Tianjin Medical University between December 2023 and February 2024. This study employed a descriptive qualitative research design. A semi-structured interview outline was developed based on the Consolidated Framework for Implementation Research (CFIR) to guide the data collection process. The collected interview data were subsequently analyzed using the thematic analysis method.

结果

Based on the Consolidated Framework for Implementation Research (CFIR), this study identified several key factors influencing the implementation of unnecessary interventions during normal labor. These factors are categorized into four facilitators, three barriers, and four neutral factors.

The identified facilitators include leadership engagement, standardized quality control protocols, evidence-based childbirth guidelines, and positive promotion through mass media. Conversely, the primary barriers consist of the entrenched beliefs and habits of practitioners, maternal exhaustion (insufficient labor force), and a shortage of midwifery human resources. Additionally, four factors were identified as neutral: the perceived role of the intervention itself, shared decision-making involving multiple parties, the adoption of a maternal-centered care philosophy, and the assessment of maternal needs.

结论

The implementation of unnecessary interventions during normal childbirth is influenced by a multitude of factors. It is essential to focus on both the facilitators and barriers within this process. Addressing the issue of excessive intervention requires a multi-faceted approach: leveraging the driving force of leadership, promoting the translational application of childbirth guidelines, and disseminating evidence-based information regarding appropriate interventions. Furthermore, it is necessary to strictly implement quality control standards, proactively manage issues such as inadequate uterine contractions, update midwifery concepts and clinical habits, and strengthen the management of midwifery human resources. By addressing these areas, healthcare systems can promote the standardization of normal childbirth, improve the quality of maternity services, and ultimately enhance maternal and infant health outcomes.

Keywords: Childbirth; Unnecessary intervention; Consolidated Framework for Implementation Research (CFIR); Analysis of influencing factors; Qualitative research

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Research on Influencing Factors of Implementation of Unnecessary Interventions during Normal Childbirth Based on the Consolidated Framework for Implementation Research: a Qualitative Research

Background

Unnecessary interventions impeded the standardized practices during normal childbirth, and therefore caused unfavorable health outcome in mothers and

their babies as well as waste of medical resources. There is a lack of comprehensive exploration of its influencing factors.

Objective To explore factors influencing implementation of unnecessary interventions during normal childbirth. And thereby provide references for promoting the standardized practices ZHAO Y, YANG Y, LIU Y, et al. Research on influencing factors of implementation of unnecessary interventions during normal childbirth based on the consolidated framework for implementation research: a qualitative research[J]. Chinese General Practice, 2025. [Epub ahead of print] Editorial Office of Chinese General Practice. This is an open access article under the CC BY-NC-ND 4.0 license.

Chinese General Practice of normal childbirth.

Methods

The descriptive qualitative methodology was utilized. Based on the Consolidated Framework for Implementation Research (CFIR), we developed the interview outline and performed semi-structured interviews with fifteen midwives in Tianjin Central Hospital of Gynecology Obstetrics and The Second Hospital of Tianjin Medical University. Thematic analysis was undertaken to analyze data.

Results

Based on the CFIR, a total of four facilitators (leadership, quality control standards, childbirth guidelines and positive publicity by mass media), three barriers (old concepts and habits of implementers, decreased expulsive force, and midwifery shortage) and four neutral factors (effects of interventions, shared decision-making of multiple stakeholders, women-centered philosophy and assessment of maternal needs) were identified as influencing the implementation of unnecessary interventions during normal childbirth.

Conclusion

The implementation of unnecessary interventions during normal childbirth is influenced by various factors. To address the issue of excessive interventions, attention must be paid to both facilitators and barriers. This can be achieved by leveraging leadership as a strategic driver, promoting the application of clinical guidelines, disseminating information regarding appropriate childbirth interventions, and strictly implementing quality control standards. Furthermore, it is essential to actively manage decreased maternal expulsive force, update the professional concepts and habits of midwives, and address the shortage of the midwifery workforce. Such measures will improve maternal and neonatal health services and lead to better health outcomes. Normal childbirth is advocated by international organizations and midwifery or obstetric associations across multiple countries, emphasizing the appropriate use of beneficial interventions during the labor process. However, with the advancement of obstetric medical

technology, the application of artificial interventions—including artificial rupture of membranes, episiotomy, and continuous electronic fetal monitoring—has gradually increased. Consequently, many women undergo unnecessary interventions during childbirth [**?**]. As early as 2016, an article published in *The Lancet* pointed out that excessive unnecessary intervention in normal childbirth is a global phenomenon. In China, this issue remains effectively unresolved, seriously restricting the standardized and effective implementation of normal childbirth, causing a waste of medical resources, and hindering the improvement of maternal and child health service quality [**?**, **?**]. Analyzing the factors influencing the implementation of unnecessary interventions is a critical prerequisite for solving the problem of over-intervention and promoting the standardized practice of normal childbirth.

Currently, there is a lack of comprehensive research regarding the factors influencing the implementation of unnecessary interventions during normal childbirth [**?**, **?**]. The Consolidated Framework for Implementation Research (CFIR) is a "meta-theoretical framework" constructed by integrating elements from existing theories, frameworks, and models related to behavior change, cognition and decision-making, environment, and organizational structures. Due to its broad scope and comprehensive content [**?**], the CFIR is highly suitable for a holistic assessment of the factors influencing the implementation of unnecessary interventions in normal childbirth. Numerous scholars have already applied the CFIR to investigate the influencing factors of unnecessary interventions, such as non-essential pharmacological treatments, unnecessary surgeries, and redundant medical examinations.

分析

[15-16]. In view of this, the present study utilizes the Consolidated Framework for Implementation Research (CFIR) to analyze the factors influencing the implementation of non-essential interventions during normal childbirth. The objective is to provide a theoretical and practical reference for promoting the standardized management of normal labor and delivery.

1.1 研究对象

Using a purposive sampling method, midwives from the Tianjin Central Hospital of Gynecology and Obstetrics and the Second Hospital of Tianjin Medical University were selected as research subjects between December 2023 and February 2024. The inclusion criteria were as follows: (1) practicing midwives holding a Nurse Practitioner Certificate of the People' s Republic of China and a Maternal and Child Health Care Qualification Certificate; (2) midwives with at least one year of experience in midwifery who are currently working on the clinical frontline; and (3) those who voluntarily participated in this study. Midwives who were visiting scholars, on rotation, or interns were excluded.

The sample size was determined based on the principle of information satura-

tion. Ultimately, 15 midwives were included in the study. The participants were aged 31 to 52 years, with a mean age of (36.4 ± 5.0) years. Their professional experience ranged from 8 to 33 years, with a mean of (13.5 ± 6.0) years. Regarding educational background, 2 held junior college degrees, 11 held bachelor' s degrees, and 2 held master's degrees. In terms of professional titles, there were 4 nurse practitioners, 10 supervisor nurse practitioners, and 1 co-chief superintendent nurse practitioner. This study was approved by the Ethics Committee of Tianjin Medical University (TMUhMEC2023007), and all participants provided signed informed consent.

1.2.1 制定访谈提纲

In the early stages of this study, the research team systematically reviewed and summarized 12 non-essential interventions based on clinical practice guidelines for normal labor. Building upon this foundation and utilizing the 2022 updated Consolidated Framework for Implementation Research (CFIR) interview guide tool, a preliminary interview outline was developed. This outline covers five key domains: innovation characteristics, inner setting, outer setting, individual characteristics, and the implementation process [**?**]. Following preliminary interviews with two midwives, the outline was further refined to establish the final version, as shown in .

1.2.2 资料收集方法

This study employed a descriptive qualitative research design, utilizing face-to-face semi-structured individual interviews for data collection. Prior to the interviews, the researchers explained the study' s objectives and content to the participants and obtained their informed consent. Interviews were scheduled at mutually convenient times and conducted in quiet environments, such as hospital offices, conference rooms, or lounges. Each interview lasted approximately 30 to 60 minutes.

1.2.3 资料分析方法

Within 24 hours of completing the interviews, the audio recordings were transcribed verbatim. Two researchers independently performed preliminary coding and categorization after repeatedly reading the interview transcripts. The Consolidated Framework for Implementation Research (CFIR) was utilized for deductive analysis to identify specific coding roots.

Key words: Parturition; Unnecessary intervention; Consolidated framework for implementation research; Root cause

In the context of normal labor and delivery, how do you implement procedures such as perineal disinfection with chlorhexidine, perineal shaving, artificial rupture of membranes, enemas, fundal pressure, intravenous fluids (to shorten labor), episiotomy, neonatal oropharyngeal suctioning, uterine massage during

the third stage of labor, continuous fetal heart monitoring, and prophylactic antibiotic use? Who are the primary decision-makers and practitioners for these interventions? Furthermore, what effects do you believe these interventions have on maternal and neonatal health, as well as maternal satisfaction?

What external factors, such as policies, regulations, or clinical guidelines, do you believe influence the implementation of these interventions? What is your understanding of how these interventions are practiced in other hospitals, and how does this knowledge influence your own clinical practice?

What internal factors, such as equipment, facilities, or departmental culture, do you believe influence the implementation of these interventions? To what extent are you familiar with the recommendations provided by evidence-based guidelines regarding these practices? What are your perspectives on the current implementation of unnecessary interventions?

How necessary do you believe it is to change the implementation of these interventions? If change is required, how should it be achieved, and how would you rate the level of difficulty involved? Prior to the start of the study, the interviewers underwent training to master interview techniques and relevant protocols.

The entire interview process was recorded using audio equipment, during which the interviewers paid close attention to the participants' tone, facial expressions, and gestures. Interviewers maintained a neutral stance, avoiding any leading questions, interference, or judgment, while ensuring timely paraphrasing, follow-up questioning, and clarification of the content. Within 24 hours of the interview, the recordings were transcribed verbatim. When necessary, follow-up interviews were conducted to supplement data, and transcripts were returned to the participants to ensure information accuracy. The data were analyzed by two researchers, and any disagreements during the analysis process were resolved through repeated discussion until a consensus was reached.

2 结果

Based on the Consolidated Framework for Implementation Research (CFIR), this study identified four facilitators, three barriers, and four neutral factors influencing the implementation of unnecessary interventions during normal childbirth. Since the objective of this research is to explore how to rectify the practice of unnecessary interventions (rather than promoting their use), factors that reduce or prevent such interventions are classified as facilitators. Conversely, factors that increase the implementation of unnecessary interventions are classified as barriers. Factors whose impact on the implementation of unnecessary interventions is unclear, insignificant, or near zero are categorized as neutral factors.

The domain of "Individuals"refers to the roles and characteristics of the personnel involved. Within this domain, one facilitator and two barriers were identified.

2.1.1 领导力主导（促进因素）

Head nurses, as leaders, can effectively encourage midwives to reduce the implementation of unnecessary interventions during normal childbirth. This leadership influence is highlighted by several participants. For instance, M6 noted: "Reform is extremely difficult, and changing established habits is a significant challenge. It is essential to initiate change from the head nurse' s level; recent initiatives we have implemented, such as upright birth positions and prone positioning for newborns, were driven this way." Similarly, M8 emphasized the impact of leadership priorities on clinical practice: "It is closely related to the leader' s perspective. Our previous head nurse, for example, placed great importance on the episiotomy rate. She would personally track and analyze the statistics for episiotomies and neonatal asphyxia every month."

2.1.2 实施者的旧观念和习惯（阻碍因素）

Interview results indicate that the outdated perspectives and long-standing habits of midwives (the practitioners) are significant factors contributing to the implementation of non-essential interventions during normal childbirth. As noted by one participant, "I know we shouldn' t routinely perform suctioning [of the newborn' s nose and mouth], but I just can' t change that mindset; I still feel the need to suction a couple of times···I also know that perineal shaving is no longer recommended, yet we still do it routinely." Participant M13 further elaborated on these ingrained practices: "Regarding the suctioning of the newborn' s nose and mouth, many people have this habitual movement—a sort of stroking motion. After the baby is delivered, they squeeze the nose and lips; this is considered a 'normal' operation by many."

2.1.3 孕产妇产力不足（阻碍因素）

Due to an increasing number of maternal patients experiencing insufficient labor force, midwives often implement unnecessary interventions during normal childbirth, such as fundal pressure. As participant M7 noted: "Some multiparous women had their first child at other hospitals where fundal pressure was used. These patients tell me they can' t push anymore, saying, 'My first baby was pushed out by the doctor pressing on my stomach,' and they request that we apply pressure to the fundus as well." Similarly, M15 remarked: "We often have a saying that the baby wasn' t delivered by the mother, but by us, because we use every possible method to assist and intervene···If she simply cannot push and her labor force is exhausted, she becomes increasingly tired and weak. If this continues too long, the risks increase. While patients with good physical conditions usually have smooth labor progress led by themselves with relatively few interventions, such individuals are far too rare nowadays." According to literature [**?**], interventions in this study refer to the implementation of unnecessary procedures during normal delivery, such as non-essential artificial rupture of membranes, episiotomy, and continuous electronic fetal monitoring. Within

this domain, one neutral factor was identified: the perceived role of intervention. Some midwives interviewed believed that interventions such as uterine massage during the third stage of labor, perineal shaving, and continuous fetal monitoring have significant clinical value and help promote the physical and mental health of both mother and infant; therefore, these are frequently implemented during normal delivery.

Continuous fetal monitoring provides ongoing surveillance of the fetus; innovation refers to the "thing" being implemented, and it is only through such monitoring that the condition of the child in utero can be determined. M5 stated: "Uterine massage is a procedure everyone must undergo after delivery to prevent and reduce hemorrhage···Shaving the pubic hair is the same; otherwise, the risk of infection would increase."

Midwives believe that interventions such as fundal pressure are detrimental to maternal and infant health and therefore seek to reduce or avoid their implementation during normal delivery. M9 explained: "With fundal pressure, some mothers may develop subcutaneous bruising. In more severe cases, I have heard of patients who, after being discharged and returning home for a while, experienced unexplained abdominal pain, trauma, or even splenic rupture. While it is uncertain if there is a direct causal relationship, adding this procedure certainly raises the level of risk."

The domain of inner setting factors refers to the environment in which the innovation is implemented, such as hospitals or schools. Within this domain, two neutral factors, one facilitator, and one barrier were identified.

2.3.1 多方共同决策（中性因素）

In normal labor, the implementation of non-essential interventions—such as artificial rupture of membranes (AROM) and prophylactic antibiotic use—is a collaborative decision-making process involving midwives, obstetricians, the pregnant woman, and her family. As participant M4 noted: "The decision-makers for these interventions include both doctors and midwives."

Midwives provide continuous monitoring throughout the labor process, while doctors conduct periodic assessments. Regarding the division of labor, M13 stated: "Artificial rupture of membranes is performed by the doctor···and the use of antibiotics requires a doctor' s order, which we then execute." Furthermore, some midwives mentioned that formal informed consent, evidenced by the signatures of the woman and her family, is required before performing AROM.

"Rupturing the membranes requires a signature; it can only be performed once the family has given permission. A signature is mandatory prior to the procedure."

2.3.2 助产人力资源不足（阻碍因素）

During the interviews, midwives expressed the view that routine continuous electronic fetal monitoring (EFM) remains necessary during normal labor due to a shortage of midwifery human resources. M7 noted: "The issue is manpower ···for example, if one midwife is responsible for [multiple] patients, by the time you finish listening to one round of fetal heart tones, an hour has already passed, and it is already time to start the next round." Similarly, M14 remarked: "If we had single-room labor wards or sufficient staffing, it might be possible to avoid continuous fetal monitoring···however, when there are many patients and staffing levels are inadequate, continuous monitoring is required. Having a central monitoring station feels much safer under those circumstances."

2.3.3 质量控制规范（促进因素）

The interview results indicate that quality control protocols at the hospital or department level contribute to reducing or avoiding the implementation of unnecessary interventions. As participant M1 noted: "I believe every hospital is committed to development and to reducing the rate of episiotomies." Similarly, M11 stated: "The episiotomy rate has been monitored for many years; we track each individual' s rate every month specifically to keep it under control··· For instance, fundal pressure is no longer performed because there are explicit regulations prohibiting it."

2.3.4 以孕产妇为中心的理念（中性因素）

During the interviews, midwives emphasized that a maternal-centered cultural philosophy is a critical factor influencing the implementation of non-essential interventions during normal childbirth. M4 stated: "I believe we should be patient-centered; the comfort of the mother and the newborn must be prioritized, and maternal and infant safety must be guaranteed—everything else is secondary." Similarly, M8 noted: "Decisions are always made with the patient' s best interests in mind···the primary focus remains starting from the patient' s own perspective and considering all aspects of both the mother and the child."

Outer Setting Domain The outer setting refers to the broader environment in which internal factors are situated, such as the healthcare system and school districts. Within this domain, two facilitating factors were identified.

2.4.1 分娩相关指南（促进因素）

The interviewed midwives believe that childbirth-related guidelines are instrumental in reducing or avoiding unnecessary interventions during normal labor.

M3 noted: "We are constantly learning from these guidelines. For example, regarding neonatal oronasal suctioning, we used to perform it on every newborn. However, the guidelines later specified that routine suctioning is not

recommended. Consequently, we ceased routine suctioning. We primarily rely on new guidelines and expert consensus to update our knowledge and modify our previous clinical practices."

M12 added: "One of our doctors returned from a training program in the United Kingdom, and subsequently, our protocol for vaginal examinations was updated in accordance with international guidelines."

2.4.2 大众媒体正向宣传（促进因素）

Interview results indicate that positive publicity in mass media can, to a certain extent, reduce the implementation of unnecessary interventions such as episiotomies. As noted by participant M15: "Information is quite accessible now. Some women see content online about 'no episiotomy' and 'no tearing,' which leads them to form a fixed concept that avoiding these outcomes is preferable. Consequently, some expectant mothers have become quite resistant to the procedure."

2.5 实施过程领域

The implementation process refers to the activities and strategies involved in executing an innovation, encompassing the complete progression from "team formation" to "application adjustment." Within this domain, one neutral factor was identified: maternal needs assessment. During interviews, midwives maintained that the decision to implement non-essential interventions during normal labor should be dictated by the specific needs of the mother.

As participant M3 noted: "If the pubic hair is particularly thick, we will perform shaving because it interferes with suturing; therefore, the decision is made based on the specific circumstances." Similarly, participant M11 explained: "In the third stage of labor, we monitor uterine contractions. If the contractions are weak, the uterine fundus feels soft, or the contour is poorly defined, then massage might be beneficial···It is a matter of assessing the specific situation. The level of intervention depends on the woman; we analyze each case individually. In obstetrics, I believe every patient is different."

3.1.1 发挥领导力的牵引带动作用

This study found that head nurses play a leading role in determining whether unnecessary interventions are implemented during normal childbirth, a finding consistent with previous research. Sarkies et al. found that leadership plays a central role among the factors influencing unnecessary hospitalizations for patients with chronic diseases. Furthermore, studies by Zhao et al. and Brownson et al. [**?**, **?**] indicate that leadership is the most commonly utilized strategy for promoting the implementation of evidence-based interventions. Leadership facilitates the application of evidence-based practices in clinical settings by promoting the use of scientific information during decision-making, creating supportive

organizational cultures and environments, ensuring the rational allocation of medical resources, and improving communication among organizational members [**?**, **?**].

Regarding the implementation of unnecessary interventions during normal childbirth, leaders (specifically head nurses) can reduce the use of non-essential procedures—such as episiotomies and fundal pressure—by strictly enforcing quality control standards and fostering a cultural atmosphere centered on quality improvement and maternal-centered care. Consequently, future research should further explore methods to support and cultivate leaders, fully leveraging the driving force of leadership to promote the standardized practice of normal childbirth.

3.1.2 推动分娩指南转化应用

This study found that childbirth-related guidelines are a critical factor influencing the implementation of unnecessary interventions during normal labor. International evidence-based guideline translation and application projects—such as the "Better Births" initiative in the UK and similar programs in India—have demonstrated that the clinical application of evidence-based childbirth guidelines can effectively reduce the implementation of interventions that adversely affect maternal and infant health, such as non-medically indicated cesarean sections and episiotomies. These guidelines improve the quality of maternity services and enhance birth outcomes. Evidence-based guidelines are constructed using rigorous methodologies that comprehensively synthesize the best available evidence while balancing benefits, risks, and cost-effectiveness. Such guidelines assist medical personnel in making informed decisions during the labor process and provide an effective pathway for standardizing maternity services and addressing the issue of "too much, too soon." *The Lancet Commission on Reproductive, Maternal, Newborn, Child, and Adolescent Health in China* noted that poor adherence to guidelines is a primary driver of the "too much, too soon" phenomenon in China' s maternity services and remains a significant contemporary challenge.

Chinese General Practice. Therefore, based on the investigation of these influencing factors, it is necessary to explore implementation strategies for evidence-based childbirth guidelines tailored to Chinese medical institutions. Such strategies are essential to effectively address the "too much, too soon" problem in maternity services.

3.1.3 宣传传播正确的分娩干预

One of the critical challenges currently facing maternal and neonatal safety is the prevalence of non-essential medical interventions. This study finds that positive promotion through mass media can effectively reduce the implementation of unnecessary procedures such as episiotomies. Pregnant women who wish to avoid episiotomies are primarily influenced by content disseminated across mass

media regarding “no episiotomy, no tearing”outcomes, a finding that is consistent with previous research.

For instance, Bubpawong et al. [**?**] demonstrated that positive mass media campaigns can effectively reduce the rate of non-essential cesarean sections. Similarly, Walker et al. [**?**] found that providing health education to patients via mass media significantly reduces the inappropriate use of antibiotics. Currently, mass media represents the only intervention strategy specifically targeting patient populations to reduce low-value medical care.

In the contemporary “Internet+” era, expectant mothers can acquire a wide range of maternal health knowledge through various digital platforms, such as WeChat, maternal and child health websites, and specialized mobile applications. Consequently, online media can serve as a vital pathway for reducing non-essential interventions during childbirth. By disseminating accurate information regarding delivery interventions to the maternal population, these platforms can improve maternal and infant health outcomes while simultaneously reducing the waste of medical resources.

3.1.4 严格落实质量控制规范

This study finds that quality control protocols are effective measures for reducing or avoiding the implementation of non-essential interventions during normal labor. Quality control protocols serve as both the practice standard and the safety guarantee for medical interventions. By establishing standard operating procedures and evaluation indicator systems, these protocols reduce or eliminate the variability and randomness in interventions caused by differences in individual habits or clinical experience among medical personnel. Currently, such protocols have been widely applied to the systematic and scientific management of various medical interventions, such as the diagnosis and nursing of patients with chronic obstructive pulmonary disease (COPD) and the administration of psychotropic medications. The results of this study further suggest that quality control protocols are an effective means of regulating labor interventions. Consequently, efforts should be made to further improve the monitoring indicator systems and platform construction for labor interventions, strengthen quality control training for medical staff, and strictly implement quality control standards. These actions will promote the standardized implementation of labor interventions and effectively advance high-quality maternity services.

Mitigating the barriers to increasing the implementation of non-essential interventions in normal labor.

3.2.1 积极应对产力不足

Maternal patients are key stakeholders in the process of normal childbirth. This study finds that insufficient maternal labor force is a critical factor influencing the implementation of non-essential interventions during normal delivery. Simi-

larly, research by Downe et al. [**?**] demonstrates that maternal birthing capacity is a significant determinant in the application of obstetric interventions.

In China, following the adjustment and refinement of fertility policies alongside shifts in modern lifestyles, the proportion of advanced maternal age and high-risk pregnancies has risen rapidly. This weakening of maternal birthing capacity has further driven an increase in the use of various interventions during labor. Consequently, to address the issue of insufficient labor force in advanced-age and high-risk maternal patients, it is necessary to conduct a comprehensive and in-depth analysis of the underlying causes. Individualized intervention strategies—such as pharmacological therapy, scientific exercise regimens, and psychological support—should be developed to reduce the implementation of non-essential interventions during delivery and promote the standardized practice of normal childbirth.

3.2.2 更新助产观念和习惯

Midwives serve as the core providers of normal labor care and are the primary implementers of clinical interventions during childbirth. The results of this study indicate that the attitudes and habits of midwives are significant factors driving the implementation of unnecessary interventions in normal labor, a finding consistent with the research conducted by ZHAO et al. \cite{ZHAO_{{{ET}}_{{AL}}}}.

As medical knowledge and technology continue to advance, healthcare professionals must continuously update outdated perspectives and practices to improve patient health outcomes. However, de-implementing existing interventional practices often proves more difficult than introducing new ones. When reducing or abandoning established clinical interventions, healthcare providers must assume greater responsibility and often face heightened concerns regarding potential medical malpractice, as noted by ZONDAG et al. \cite{ZONDAG_{{{ET}}_{{AL}}}}.

The findings of this study further suggest that reducing or avoiding unnecessary interventions in normal labor requires a focused effort to transform the existing attitudes and habits of midwives. This can be achieved through targeted education and training, the implementation of accountability tools [**?**, **?**], and the continuous updating of professional knowledge, clinical skills, and care philosophies.

3.2.3 强化助产人力管理

Influenced by the shortage of midwifery human resources, the findings regarding the continued implementation of routine interventions in normal labor remain consistent. Midwives are the core of normal labor care and the primary implementers of labor interventions. Insufficient midwifery staffing exerts a dual impact on the implementation of these interventions. On one hand, beneficial

labor interventions for maternal and infant health are not widely or effectively applied; on the other hand, interventions that have no impact or even adverse effects on maternal and infant health (i.e., unnecessary interventions) are frequently utilized. Therefore, promoting the standardized implementation of normal labor requires further improvement in the allocation of midwifery human resources. Midwifery staffing should be reasonably configured according to the level, type, and workload of different delivery rooms to ensure both the quantity and quality of personnel required for normal labor. This provides the necessary human resource guarantee to promote standardized labor practices and improve maternal and infant health outcomes.

Consideration must also be given to neutral factors that influence the implementation of unnecessary interventions during normal labor, such as the routine implementation of continuous electronic fetal monitoring, which is consistent with the findings of Wang Xiaojiao et al. [**?**].

The perceived role of interventions, shared decision-making among multiple parties, the concept of woman-centered care, and the assessment of maternal needs are neutral factors influencing the implementation of unnecessary interventions in normal labor. Among these, the role of an intervention exhibits a threshold effect; when the threshold for adverse effects on maternal and infant health is not reached, it has no impact on the implementation of unnecessary interventions.

However, once this threshold is reached, the implementation of unnecessary interventions decreases. For example, the adverse consequences of continuous fetal heart rate monitoring include increased rates of cesarean sections and instrumental deliveries; when these negative outcomes occur, they prompt medical staff to reduce the application of such monitoring. Shared decision-making, maternal needs assessment, and woman-centered care are all condition-dependent. When multiple stakeholders collectively make correct decisions, conduct accurate assessments, and when maternal needs are reasonable, the implementation of unnecessary interventions in normal labor can be reduced or avoided; otherwise, such interventions may increase. The impact of woman-centered care is also influenced by individual factors such as maternal values, preferences, and economic status, introducing a degree of uncertainty. In the process of promoting the standardized implementation of labor interventions, it is necessary to account for these neutral factors and facilitate their transformation into promoting factors. For instance, regarding the threshold effect of interventions, education and training for medical staff should be strengthened to emphasize the adverse consequences of unnecessary interventions. Regarding the condition-dependency of shared decision-making and needs assessment, stakeholders—including medical staff, pregnant women, and their families—should be informed about appropriate labor intervention measures to guide them toward correct assessments and decision-making.

Chinese General Practice. Stakeholders such as medical staff, pregnant women, and their families should be educated on correct labor intervention measures to guide them in making accurate assessments and decisions.

Research Limitations

This study has certain limitations. The interview subjects were limited to midwives from tertiary Grade A hospitals in Tianjin, and other secondary stakeholders such as administrators, pregnant women, and their families were not included. This lack of a multi-perspective exploration of influencing factors means the research results have certain limitations, and the generalizability of the conclusions is restricted. Future research could expand the scope of participants to include stakeholders such as administrators, midwives, obstetricians, pregnant women, and their families to verify the accuracy and extrinsic validity of these findings from diverse perspectives.

4 小结

Based on the Consolidated Framework for Implementation Research (CFIR), this study identifies the factors influencing the implementation of non-essential interventions during normal labor. We identified four facilitators: leadership guidance, quality control standards, labor-related guidelines, and positive mass media promotion. Three barriers were identified: outdated concepts and habits among practitioners, insufficient maternal expulsive force, and a shortage of midwifery human resources. Additionally, four neutral factors were identified: the perceived role of interventions, shared multi-party decision-making, maternal-centered care philosophy, and maternal needs assessment. To address the issue of excessive childbirth interventions, efforts should focus on leveraging these facilitators and mitigating the barriers. Specifically, we recommend fully utilizing the leading role of leadership, promoting the clinical translation of labor guidelines, actively disseminating information regarding appropriate interventions, and strictly implementing quality control standards. Furthermore, it is essential to proactively address maternal exhaustion, update obsolete midwifery practices, and optimize the allocation of midwifery staff. These measures will promote the standardization of normal labor management in China, advance high-quality maternity services, and improve maternal and infant health outcomes.

Author Contributions: Zhao Yang was responsible for the study conception and design, and drafted the manuscript; Yang Ying, Liu Yu, Gao Bingjie, and Mei Na were responsible for the implementation of the study, as well as data collection, organization, and analysis; Zhao Yang, Yang Ying, and Yin Xuemei were responsible for the analysis and interpretation of the results; Yin Xuemei was responsible for the quality control of the study implementation, the revision of the final manuscript, and holds overall responsibility for the article.

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Development and Analysis of the Concept and Scope of Normal Birth

Introduction

The definition of "normal birth" is a fundamental concept in obstetrics and midwifery. However, with the increasing medicalization of childbirth and the continuous advancement of obstetric technology, the boundaries of what constitutes a "normal" birth have become increasingly blurred. This paper explores the historical development, evolving definitions, and the scope of normal birth to provide a theoretical basis for clinical practice and policy-making.

1. The Evolution of the Concept of Normal Birth

Historically, childbirth was viewed as a natural physiological process. However, the 20th century saw a significant shift toward the medicalization of birth. In early obstetric literature, a normal birth was often defined simply by the absence of complications. As medical interventions became more common, the definition began to shift from a physiological perspective to a more clinical and risk-managed perspective.

The World Health Organization (WHO) has played a pivotal role in redefining this concept. In 1996, the WHO defined normal birth as: "spontaneous in onset, low-risk at the start of labor and remaining so throughout labor and delivery. The infant is born spontaneously in the vertex position between 37 and 42 completed weeks of pregnancy. After birth, mother and infant are in good condition."This definition emphasizes that normality is not just the absence of pathology but a state of low risk and spontaneous progression.

2. The Scope and Boundaries of Normal Birth

Defining the scope of normal birth requires distinguishing between physiological processes and medical interventions. There is ongoing debate regarding whether certain interventions—such as the use of oxytocin for augmentation, epidural anesthesia, or episiotomy—exclude a birth from being classified as "normal."

2.1 Low-Risk Status The foundation of a normal birth is the "low-risk" status of the mother and fetus. This status is dynamic and must be reassessed throughout the labor process. A birth that begins as low-risk may transition to high-risk if complications such as fetal distress or prolonged labor arise.

2.2 Spontaneity and Intervention A key point of contention is the level of intervention compatible with the term "normal." Some scholars argue for a "natural birth" definition, which excludes all medical interventions. Others suggest a broader "normal birth" category that allows for minor interventions aimed at supporting the physiological process rather than replacing it.

3. Analysis of Current Perspectives

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Interpretation of the Components of the Updated Consolidated Framework for Implementation Research (CFIR 2022)

Abstract

Implementation science frameworks provide a theoretical basis for identifying factors that influence the implementation of evidence-based interventions and for evaluating implementation outcomes. As one of the most widely utilized frameworks in the field, the Consolidated Framework for Implementation Research (CFIR) has undergone a significant update. This paper aims to interpret the core components of the updated CFIR 2022, systematically comparing it with the original 2009 version. By detailing the specific changes across its five domains—Innovation, Outer Setting, Inner Setting, Individuals, and Process—this article provides a theoretical reference for domestic researchers to better understand and apply the updated framework in implementation science research.

Introduction

Implementation science is the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and hence, to improve the quality and effectiveness of health services. To understand the complex mechanisms of implementation, researchers have developed numerous theoretical frameworks. Among these, the Consolidated Framework for Implementation Research (CFIR), first proposed by Damschroder and colleagues in 2009, has become one of the most influential and frequently cited frameworks globally.

However, as the field of implementation science has evolved over the past decade, users have identified several limitations in the original framework, such as the need for a more person-centered approach and a better reflection of the dynamic nature of implementation contexts. In response, the original authors published an updated version, CFIR 2022, which refines the definitions of constructs and reorganizes the framework' s structure to enhance its utility and applicability.

1. Overview of the CFIR 2022 Update

The CFIR 2022 maintains the original structure of five primary domains but introduces substantial revisions to the underlying constructs. The update focuses on increasing the clarity of definitions, ensuring the framework is centered on the individuals involved in the implementation process, and acknowledging the role of equity and external determinants more explicitly.

As shown in , the total number of constructs and sub-constructs has been expanded and refined. The most notable shift is the transition from a focus on

the "intervention" to the "innovation," reflecting a broader scope that includes programs, policies, and clinical practices.

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Abstract

Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable, and treatable chronic airway disease characterized by persistent respiratory symptoms and airflow limitation. Acute Exacerbation of Chronic Obstructive Pulmonary Disease (AECOPD) is a critical event in the clinical course of the disease, significantly impacting patients' quality of life, increasing the risk of mortality, and imposing a substantial economic burden on healthcare systems. Clinical practice guidelines emphasize the importance of standardized management and quality control interventions to improve patient outcomes. However, there is a lack of large-scale, real-world evidence regarding the impact of medical quality control interventions on the risk of future acute exacerbations.

This study utilizes real-world clinical data to investigate the relationship between medical quality control interventions and the risk of AECOPD recurrence. By leveraging machine learning and deep learning techniques, we aim to develop and validate a robust risk prediction model that incorporates quality control metrics to assist clinicians in identifying high-risk patients and optimizing management strategies.

1. Introduction

COPD remains a leading cause of morbidity and mortality worldwide. The management of COPD focuses on symptom relief, improving exercise tolerance, and, most importantly, reducing the frequency and severity of acute exacerbations. AECOPD is often triggered by respiratory infections or environmental factors, leading to a sudden worsening of symptoms that requires additional therapy. Frequent exacerbators experience a more rapid decline in lung function and have a poorer prognosis.

Medical quality control (QC) interventions, which include adherence to pharmacological guidelines, smoking cessation counseling, pulmonary rehabilitation, and regular follow-up, are designed to standardize care. While the efficacy of these interventions has been demonstrated in controlled clinical trials, their effectiveness in diverse, real-world populations remains to be fully elucidated.

Furthermore, the integration of QC data into predictive modeling offers a novel approach to personalized medicine in respiratory care.

2. Methods

2.1 Data Source and Study Population

This study is based on a retrospective analysis of electronic health records (EHR) from a multi-center real-world database. We included patients diagnosed with COPD who experienced at least one hospitalization for an acute exacerbation. Data points collected include demographic information, clinical characteristics, laboratory results, imaging findings, and specific medical quality control indicators.

2.2 Quality Control Indicators

The quality control interventions analyzed in this study include: - Adherence to GOLD (Global Initiative for Chronic Obstructive Lung Disease) treatment guidelines. - Implementation of standardized inhalation therapy

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Note: Figure translations are in progress. See original paper for figures.