Effectiveness of Standardized Intrapartum Clinical Pathway Nursing Intervention on Maternity Nurses' Performance, Labor Outcomes, and Maternal Satisfaction

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Abstract

Background: A clinical pathway is a collaborative management approach grounded in evidence-based practices, outlining and optimizing the various interventions performed by healthcare professionals in patient care. **Aim**: To evaluate effectiveness of standardized intrapartum clinical pathway nursing interventions on maternity nurses' performance, labor outcomes and maternal satisfaction. **Design**: A quasi-experimental design was used. **Settings**: This study was conducted at obstetrics departments of three main hospitals at Tanta City. **Sample**: A purposive sample of 60 maternity nurses and 120 intrapartum women. **Tools**: **Tool (I):** Maternity Nurses' Knowledge Structured Interviewing Questionnaire. **Tool (II):** Maternity Nurses' Practices Observational Checklist. **Tool III:** Structured Interviewing Questionnaire for Parturient Women. **Tool (IV):** Parturient Women Practices Observational Checklist in relation to ICP. **Tool (V):** Numeric Pain Intensity Scale. **Tool (VI):** Labor Outcomes Assessment Framework. **Tool (VII):** Maternal Satisfaction regarding Intrapartum Clinical Pathway. **Results**: The clinical pathway intervention significantly improved nurses' knowledge and practices, reduced severe pain, led to better labor outcomes and higher maternal satisfaction. **Conclusion**: The use of a clinical pathway positively influenced maternity nurses' performance, labor outcomes. **Recommendations**: Implementing clinical pathway-based training for maternity nurses can enhance maternity nurses' competencies and lead to improved labor outcomes and maternal satisfaction.

Keywords: Intrapartum clinical pathway, nurses' performance, labor outcomes, and maternal satisfaction.

Introduction

Intrapartum nursing care encompasses the clinical support and continuous monitoring provided by maternity nurses throughout labor and childbirth, playing a critical role in ensuring maternal and neonatal safety. Despite global initiatives such as the United Nations Sustainable Development Goal 3 (SDG3), which aims to reduce the global maternal mortality rate to fewer than 70 deaths per 100,000 live births, the quality of intrapartum care in many

low- and middle-income countries remains inadequate. This persistent gap in care delivery has been identified as a major factor contributing to the high rates of maternal mortality observed in these regions. (**World Health Organization, 2023; United Nations, 2018).**

The World Health Organization reports that more than 850 women die each day from preventable complications related to childbirth, with 99% of these maternal deaths occurring in low- and middle-income countries. Studies suggest that a significant number of these deaths could be avoided through the use of simple, cost-effective measures—such as the implementation of clinical pathways. Clinical pathways (CPWs) are recognized for their ability to support nurses in improving patient care by providing structured guidance and evidence-based recommendations for clinical decision-making. **(Sarikhani, Y., Najibi, S. M., & Razavi, Z. (2024); World Health Organization, 2019).**

Clinical pathways serve as vital instruments in translating evidence-based guidelines into practical, structured care processes that are tailored to the specific context and culture of individual healthcare institutions. These multidisciplinary care plans are designed to integrate clinical recommendations and research evidence into local practice, promoting consistency and quality across care delivery. By offering a clear, step-by-step framework for managing particular medical conditions, procedures, or care episodes, clinical pathways help standardize treatment approaches for defined patient populations. **(Barrientos, P. C., Haas, C. M., & Beyzaga, L. A. (2020); Busse et al., 2019).**

Clinical pathways (CPWs) play a significant role in improving healthcare efficiency by reducing hospital stays, decreasing mortality rates, and lowering healthcare costs, all while enhancing patient outcomes and boosting staff satisfaction. They also promote interdisciplinary collaboration, ensuring that healthcare professionals, patients, and families are aligned in care planning and decision-making **(Dawoud, Mohamed, & Ahmed, 2023; Lockhart, 2015)**. A Cochrane Collaboration review of 27 studies involving 11,398 participants revealed that CPWs were linked to reduced hospital length of stay and lower costs compared to conventional care. Furthermore, a meta-analysis reported a reduction in in-hospital complications, and two studies noted improvements in the quality of professional documentation." **(Vallely 2023; Busse et al., 2019).**

Clinical pathways serve as effective tools for patient education and for improving access to healthcare services. CPWs also play a vital role in the training and professional development of nurses and support staff by strengthening their knowledge and clinical competencies. Additionally, CPWs aid in setting organizational

benchmarks by outlining measurable quality indicators that reflect adherence to care plans and evidence-based practice guidelines. **(Raju, R et al., (2023); Daly et al., 2018).**

Standardized Intrapartum clinical pathways (ICPs) have been shown to improve women's satisfaction with their childbirth experiences **(Hendiya et al., 2023; Lockhart, 2015).** High levels of satisfaction with intrapartum care are essential for enhancing the overall quality of maternity services and encouraging positive health-seeking behaviors among women. Satisfaction with nursing care during labor serves as a critical indicator of how effectively healthcare services meet patients' expectations and influences women's future decisions regarding healthcare facility use. Clinical pathways support continuity of care by standardizing assessment and documentation, thereby minimizing variability in clinical practices. They offer nurses structured, evidence-based guidance on expected assessment findings and care procedures for both mothers and newborns. Deviations from these standards serve as clinical decision points, enabling timely and appropriate interventions. (**Elagamy, M., Mohammed, F., & Shahin, M. (2020); Abd El-Razek, 2018).**

Intrapartum clinical pathways (ICPs) are predominantly applied in high-risk maternity care settings to improve maternal and neonatal health outcomes. In the United States, the implementation of a maternal and newborn clinical pathway enhanced inter-professional collaboration in evaluating care practices; however, it showed minimal impact on hospital length of stay or healthcare costs. Often referred to as critical pathways, multidisciplinary pathways, collaborative paths, or care maps, these structured care models incorporate evidence-based guidelines to promote standardized care protocols. Clinical pathways are widely recognized for empowering maternity nurses by providing essential direction and support in clinical decision-making. They assist healthcare professionals in designing individualized care plans, determining optimal hospital stays, and forecasting patient outcomes. Current research suggests that over 80% of hospitals have integrated clinical pathways into their care delivery systems. **(Ashour, E. S., El-Razek, A. A., & Alshamandy, S. A. A. (2024); Kinsman et al., 2017).**

Nurses' performance in intrapartum care encompasses the effective integration of clinical knowledge and hands-on skills to support women throughout labor and delivery, in accordance with evidence-based guidelines such as clinical pathways. This performance includes precise monitoring, timely and appropriate interventions, sound clinical judgment, and clear communication with both the patient and the multidisciplinary team. Equally important is the delivery of respectful, individualized care that addresses maternal comfort and

emotional needs. In addition, accurate documentation and consistent adherence to best practices are fundamental to improving maternal outcomes and increasing patient satisfaction. (**Ashour, E. S., El-Razek, A. A., & Alshamandy, S. A. A. (2024)**.

The implementation of intrapartum clinical pathways (ICPs) serves as a valuable tool for nurses, supporting both their professional growth and the evaluation of treatment processes (Li et al., 2025; Wijayanti et al., 2016). For ICPs to be truly effective, it is crucial for nursing staff to be actively involved in their development, implementation, and continuous assessment. By clearly understanding their roles, nurses are able to ensure adherence to best practices and the delivery of high-quality care. Their participation is vital at all stages of the pathway, beginning with its creation. Moreover, nurses are tasked with initiating ICPs for eligible patients and overseeing the execution of prescribed interventions and procedures. **(Flaubert, et al., 2021; Evans et al., 2014).**

Significance of the study

The implementation of clinical pathways aims to align clinical practices with established guidelines, ensuring the consistent provision of high-quality care across healthcare institutions. These pathways help standardize clinical procedures, reduce variations in practice, and improve both patient outcomes and operational efficiency. By incorporating locally tailored recommendations for managing specific health conditions, clinical pathways promote the delivery of safe, evidence-based care (Busse et al., 2019). Staff nurses are essential to the successful implementation of these pathways. Effective strategies for their adoption can enhance the quality of nursing care by broadening nurses' knowledge, improving their clinical skills, and fostering better collaboration within the healthcare team to optimize patient management. **(Wakefield, M. K., Williams, D. R., Le Menestrel, S., & Lalitha, J. (2021); Abd El-Hay, 2019).**

The existing literature on intrapartum clinical pathways (ICP) as a nursing intervention is limited, with most studies being opinion-based or descriptive in nature, focusing primarily on the implementation process rather than empirical evidence **(Reddy, 2022; Abd El-Razek, 2018).** While clinical pathways are widely recognized as crucial during the intrapartum period, there is a lack of research assessing their direct effects on nursing performance and maternal satisfaction during labor and delivery. To address this gap, the present study aims to evaluate the effectiveness of standardized intrapartum clinical pathway nursing intervention on maternity nurses' performance, labor outcomes, and maternal satisfaction.

Aim of the Study

The study aimed to evaluate effectiveness of standardized intrapartum clinical pathway nursing

interventions on maternity nurses' performance, labor outcomes, and maternal satisfaction.

Study Hypotheses

- H**0.** Maternity nurses are predicted to have a lower knowledge and practices scores regarding the intrapartum clinical pathway following the intervention compared to their pre-intervention scores.

-H1. Maternity nurses are predicted to exhibit a higher knowledge score regarding the intrapartum clinical pathway following the intervention compared to their pre-intervention scores.

-H2. Maternity nurses are expected to demonstrate a satisfactory practices scores regarding intrapartum clinical pathway after the intervention than before.

-H3. Parturient women who receive care based on the clinical pathway are expected to experience better labor outcomes compared to those receiving routine care.

-H4. Parturient women who will receive care based on the clinical pathway are anticipated to have higher satisfaction levels compared to those receiving routine care.

Operational Definitions

Standardized Nursing Intervention refers to a specific, evidence-based set of nursing actions designed to address particular patient needs, improve health outcomes, and ensure consistent care delivery. These interventions are usually pre-determined and based on best practices, clinical guidelines, or pathways that help nurses provide efficient and effective care.

The **Intrapartum Clinical Pathway** is a systematic, evidence-based approach that helps healthcare professionals provide consistent and high-quality care to women during labor and childbirth. It defines essential interventions, evaluations, and clinical decisions to promote the best possible maternal and fetal outcomes while enhancing efficiency, minimizing complications, and increasing patient satisfaction

Nurses' performance is the maternity nurses' knowledge and practices regarding ICP.

Maternal Satisfaction is a mother's assessment of her childbirth experience, encompassing the quality of care provided, emotional support, pain relief, communication with healthcare professionals, and whether her expectations were met during labor and delivery.

Labor Outcomes refers to the overall results of the childbirth process for both the mother and the newborn.

Study Design

This study implemented a quasi-experimental research design, using a pre-posttest model to measure variations in maternity nurses' performance before and after the intervention. In addition, a case-control design was employed to assess the labor outcomes as well as experiences and satisfaction of women receiving intrapartum care. This dual approach enabled a thorough evaluation of both

the effectiveness of nursing interventions (independent variable) and the impact of clinical pathways on labor outcomes and maternal satisfaction (dependent variables).

Study Settings

This study was conducted within the labor units of obstetric departments at three healthcare institutions in Tanta City. These included; (Tanta University Hospital affiliated to the Ministry of Higher Education and Scientific Research, El-Menshawy General Hospital affiliated to the Ministry of Health and Population, and El-Mabara Hospital, which is affiliated to the Health Insurance. These settings provided a diverse range of environments for the study's evaluation of intrapartum care.

Each of the previously mentioned study settings consisted of three rooms: the first room was designated for monitoring women during the first stage of labor, the second room served as the delivery room, and the last room was used for monitoring of parturient women during the fourth stage of labor.

Subjects:

The study included all available nurses (60 nurses) working in the previously mentioned healthcare settings and providing nursing care to women during the four stages of labor. Specifically, 30 nurses from Tanta University Hospital, 15 nurses from El-Menshawy General Hospital, and 15 nurses from El-Mabara Hospital participated in the study.

This study used a purposive sampling technique, selecting 120 intrapartum women. Purposive sampling was chosen to specifically include women who were receiving care during the four stages of labor at the time of the study. The 120 women were then evenly divided into two groups:"

-Study group or (intrapartum clinical pathway group) (60 women): Received intrapartum care following the clinical pathway.

-Control group or (routine care group) (60 women): Received standard routine hospital care.

The inclusion criteria for women in this study were as follows: they must be undergoing normal vaginal delivery, be Primigravida full term between 38 to 42 weeks of gestation, and free from any medical or obstetric complications. Additionally, all participants were required to provide informed consent to participate in the study.

Sample size

The sample size was calculated using the two-proportion formula, aiming for a statistical power of 80% and a significance level of $\alpha = 0.05$ to achieve a 95% confidence interval. To account for potential dropouts and non-responses, a 30% non-response rate was included in the estimation. As a result, the minimum required sample size was determined to be 60 maternity nurses and 120 intrapartum women, ensuring sufficient representation and statistical reliability."

Data collection tools:

Tool (1): Maternity Nurses' Knowledge Structured Interviewing Questionnaire regarding Intrapartum Clinical Pathway:

This structured questionnaire was developed by the researchers after an extensive review of relevant literature **(World Health Organization, (2023); Dawoud, S., Mohamed, H., & Ahmed, N. (2023).** The questionnaire was divided into two main sections:

Part 1: Demographic and Personal Data: This section gathered essential background information about the maternity nurses, including age, level of education and years of experience in maternity and intrapartum care.

Part 2: Nurses' Knowledge regarding Intrapartum Clinical Pathway

This part of the study was designed to evaluate maternity nurses' knowledge regarding the intrapartum clinical pathway using a set of structured questions. The assessment focused on several core areas, including the definition and core principles of the intrapartum clinical pathway, the essential elements it comprises, the standardized nursing interventions applied during labor, and the overall advantages of implementing clinical pathways in managing labor and childbirth.

The scoring system for assessing nurses' knowledge was structured as follows: a score of 2 was assigned for correct and complete answers, 1 for correct but incomplete answers, and 0 for incorrect answers or 'don't know.

The total knowledge score was calculated by summing individual item scores, then converted into a percentage. Based on the percentage, knowledge levels were classified as follows:"

- High level of knowledge 80-100%.
- Moderate level of knowledge 60 - <80%.
- Low level of knowledge <60%.
- **Tool (II): Maternity Nurses' Practices Observational Checklist regarding Intrapartum Clinical Pathway**
- This tool was adapted from the **(Ashour, E. S., El-Razek, A. A., & Alshamandy, S. A. A. (2024); World Health Organization (WHO, 2017)** and served as a structured checklist to assess maternity nurses' **practices** in providing intrapartum care **before and after** the implementation of the intrapartum clinical pathway. It consisted of two parts:

Part 1: Nurses' practices regarding care of parturient women in relation to ICP

This part was used to assess the maternity nurses' practice in managing intrapartum women. The checklist included **twenty-four key items** that covered the following aspects of intrapartum care:

- **Communication Skills** as: (Effectively communicating with laboring women and their families and providing clear explanations about the labor process and necessary interventions)
- **Supportive Care** as: (Offering emotional and psychological

reassurance to the woman and encouraging the presence of a companion during labor).

- **Care During the First Stage of Labor** as: (Performing a thorough assessment (such as monitoring vital signs and fetal heart rate), offering pain management options, regularly checking fetal heart rate, educating the woman about normal labor progression and care, promoting mobility and upright positioning, providing guidance on nutrition and hydration, and ensuring hygienic practices to maintain maternal well-being).
- **Care During the Second Stage of Labor** as: (Monitoring both maternal and fetal health, managing pain relief methods, regularly assessing and recording fetal heart rate, administering uterotonic medications as necessary, and guiding the woman's positioning and pushing techniques**).**
- **Care during the Third Stage of Labor** as: (Conducting maternal and newborn assessments, implementing active management of the third stage of labor to prevent complications such as postpartum hemorrhage).
- **Care during the Fourth Stage of Labor** as: (Ongoing monitoring of both the mother and newborn, including assessing maternal vital signs and uterine contractions, while fostering mother-baby bonding and encouraging early breastfeeding initiation).

Part 2: Nurses' practices regarding Intrapartum Newborn Care in relation to ICP

This part of the Clinical Pathway Checklist aimed to assess maternity nurses' practices in delivering immediate care to newborns, both before and after the clinical pathway implementation. The checklist covered the following items:

- **Newborn Assessment as:** includes evaluating the breathing effort and respiratory rate, observing skin color and signs of distress (such as cyanosis or pallor), assessing muscle tone and reflexes, and monitoring heart rate and overall condition.
- **Immediate Newborn Care** as: (Airway management: Suctioning the airway (if necessary) to ensure a clear airway**.**
- **Thermal protection**: "Immediately drying the newborn after delivery to avoid hypothermia, and promoting skin-to-skin contact to support early bonding and the initiation of breastfeeding.
- **Care of the umbilical cord** including; clamping and cutting with sterile methods) and monitoring the cord stump for any signs of infection or issues.
- **Eye Care**: Administering **prophylactic eye treatment** (e.g., erythromycin ointment) to prevent neonatal conjunctivitis).
- **Assessing the newborn includes;** recording the Apgar score at 1 and 5 minutes following birth, taking measurements of weight, length, and head circumference, and regulating body temperature using heated blankets and warmers.

- **Essential Newborn Medications: (**Vitamin K administration to prevent neonatal bleeding disorders and Administering Hepatitis B vaccine as per guidelines (if applicable)
- **Newborn Identification and Documentation**: "Ensuring accurate newborn identification with name tags and hospital records, and thoroughly documenting the newborn's condition, interventions, and parental notifications.

Significance of the Checklist

-Ensures standardized intrapartum care based on evidence-based practices.

-Enhances nurses' adherence to clinical guidelines.

-Helps identify gaps in performance and areas for further training.

-Contributes to improved maternal and neonatal health outcomes.

The scoring system for the nurses' practices in the study was structured as follows: a score of (2) for tasks performed correctly and competently, a score of (1) for tasks performed correctly but incompetently, and a score of (0) for tasks that were either not done or done incorrectly

The total practice scores for each nurse were calculated, summed up, and converted into a percentage. The scores were then classified as follows:

-Satisfactory practices (≥ 75 %).

-Unsatisfactory practices (0 < 75%).

Tool III: Structured Interviewing Questionnaire for Parturient Women

This tool was developed by the researcher after reviewing of recent related literature **(Raju, R2023; Elagamy, M., Mohammed, F., & Shahin, M. 2020)** to assess women's **socio-demographic characteristics** and evaluate the **impact of the intrapartum clinical pathway** on their knowledge and experiences regarding labor and delivery. It comprised of two parts:

Part I: Socio-demographic characteristics of parturient women

This section collected general background information about parturient women, including: Age, education level, and residence.

Part II: Parturient Women's Knowledge regarding ICP

This section assessed the impact of implementing the intrapartum clinical pathway on the women's knowledge of key aspects of their care. It covered the following main areas:"

- **Knowledge of Diet During Labor** (Awareness of the recommended dietary intake during labor, knowing which foods and fluids help sustain energy, understanding which foods to avoid and their potential impacts, and recognizing the importance of hydration for labor progression).
- **Knowledge of Activity During Labor** (Understanding the benefits of movement during labor, the effect of walking on labor progression and pain relief, awareness of safe labor positions (such as upright, squatting, and side-lying), and perceptions of mobility restrictions during labor and ways to address them).
- **Knowledge of Non-Pharmacological Pain Relief Measures: (**Understanding

of **non-**pharmacological pain relief techniques**,** such as: (Deep breathing exercises, Massage and counter-pressure techniques, Hydrotherapy (warm baths/showers), Relaxation techniques and Position changes).

- **Awareness of pharmacological pain relief methods**, including: (epidural analgesia and intravenous pain medications).
- Perceived effectiveness of different pain management strategies

The scoring system for assessing the knowledge of the studied parturient women was classified as follows: a score of (1) was given for correct and complete answers, while incorrect or 'don't know' answers were scored as (0).

The overall knowledge score was calculated, converted into a percentage, and classified as follows:

- High level of knowledge 65-100%.
- Moderate level of knowledge 50 - <65%.
- Low level of knowledge <50%.

Tool (IV): **Parturient Women Practices Observational Checklist in Relation to ICP**. It was developed by the researchers after reviewing related literature **(Ashour, E. S., El-Razek, A. A., & Alshamandy, S. A. A. (2024); Li, J., Xiang, L., Li, Q., Liu, J., & Pan, J. (2025) a**nd consists of two parts:

Part I: Assessing Parturient Women' Practices regarding

Pain Relief Measures.

This section was used to measure their practices regarding various non-pharmacological pain management strategies, including**:**

-Breathing Techniques as practicing: (Deep breathing, controlled exhalation and rhythmic breathing during contractions).

-Pushing Techniques as utilizing: (Coordinated pushing with contractions, avoidance of premature or excessive straining and following healthcare provider guidance on pushing.

-Positioning as **(**Upright positions (e.g., walking, squatting), Side-lying for comfort and relaxation and Use of birthing aids (e.g., birthing balls, support bars)

Part 2: Assessment of Mother-Newborn Bonding Interviewing Questionnaire.

This part evaluates the degree of bonding between the mother and her newborn through observational assessment of maternal behaviors. It is used to measure both positive and negative bonding indicators.

- **Positive Bonding Behaviors including:** Touching (e.g., stroking the baby's face or hands), holding (e.g., cradling the baby close to her body), cuddling (e.g., snuggling or gently rocking the baby) and kissing (e.g., expressing affection through kisses)
- **Negative Bonding Behaviors including:** Avoiding eye contact with the newborn, refusing to touch or hold the baby, not naming the infant or showing disinterest and making negative remarks about the baby's appearance or presence.

The scoring system of parturient women' practices was developed and categorized as follows: Adequately done were scored as (1), and inadequately done or not done were scored as zero (0).

The total practices score level were added and obtained for each nurse then summed up and converted into percent score and was classified as follow:

-Satisfactory practices (≥ 60 %).

-Unsatisfactory practices (0 < 60%).

Tool (V): Numeric Pain Intensity Scale.

The **Numeric Pain Intensity Scale (NPI Scale)** is a widely used and validated tool for assessing pain severity in patients and adopted from **Ferreira-Valente, M. A., Pais-Ribeiro, J. L., & Jensen, M. P. (2011).** This scale helps healthcare providers evaluate the intensity of pain experienced by intrapartum women, facilitating appropriate pain management strategies.

The **0 to 10 pain scale** allows women to **self-report** their pain level, where:

0 = No pain.

1 – 3 = Mild pain (slightly uncomfortable but manageable).

4 – 6 = Moderate pain (interferes with daily activities but tolerable).

7 – 10 = Severe pain (intense, debilitating, and may require intervention).

Tool (VI): Maternal Satisfaction regarding Intrapartum Clinical Pathway

The Maternal Satisfaction regarding ICPW is a validated 14-item scale designed to measure women's satisfaction with the care they receive during labor and delivery. This scale, originally developed in a Jordanian study, has been widely used in various research settings and adopted from **(Bitew et al., 2015). This five point Likert scale questionnaire ranges from: (**1 for Strongly Disagree**,** 2 for Disagree**,** 3 for Neutral**,** 4 for Agree, and 5 for Strongly Agree**)**

The total **maternal satisfaction score** ranges from **14 to 70** points, with higher scores indicating greater satisfaction. The scale is divided into **three key domains**, each assessing different aspects of intrapartum care:

1. **Interpersonal Care (IPC)** – 5 Items (Score: 5-25): This domain evaluates women's satisfaction with healthcare providers' interpersonal skills, including: (Respectful communication, emotional support and encouragement, responsiveness to concerns and needs, friendliness and approachability of staff and sensitivity to cultural or personal preferences). Its reliability **(Cronbach's Alpha):** 0.795.

2. Information and Decision-Making (IDM) – 4 Items (Score: 4-20). This domain assesses the extent to which women felt informed and involved in decision-making regarding their care, including:(Explanation of procedures and interventions, opportunities to ask questions, respect for patient autonomy in decision-making, informed consent process.

Note: three items in this domain were **reverse-scored** to account for negative

phrasing. Its **reliability (Cronbach's Alpha):** 0.674.

3. Physical Birth Environment (PBE) – 5 Items (Score: 5-25). This domain focuses on the hospital's physical environment and comfort level**,** including: (Cleanliness and hygiene of labor and delivery rooms, availability of necessary medical equipment, privacy during labor and delivery, noise levels in the hospital setting, overall comfort and ambiance of the birth environment). Its reliability **(Cronbach's Alpha):** 0.774.

Tool (VII): Labor Outcomes Assessment Framework:

This tool was designed by the researcher following a review of recent relevant literature **(Flaubert, J. L., et al., 2021; Wakefield, M. K., et al., 2021),** and was utilized to evaluate maternal and fetal/neonatal outcomes among parturient women. These outcomes reflect the degree to which the health status of both the mother and the fetus/newborn remains within normal or abnormal ranges from the onset of labor through to childbirth. The tool is composed of the following two main sections:

Part (1): Maternal outcomes assessment: This section assessed the influence of the Intrapartum Clinical Pathway (ICP) on the maternal condition. The evaluation focused on several key indicators, including the duration of the first and second stages of labor, the mode of delivery, and the underlying reasons for performing a cesarean section.

Part (2): Fetal outcomes assessment: This section was used to assess the impact of the Intrapartum Clinical Pathway (ICP) on fetal health. Fetal outcomes were measured based on several factors, including the APGAR score, birth weight in kilograms, the need for admission to the Pediatric Intensive Care Unit (PICU), the time at which breastfeeding was initiated, and whether breastfeeding started successfully.

Validity & Reliability:

The study tools (I to IV) underwent a content validity assessment by five experts in obstetrical nursing. Based on their input, revisions were made to ensure the tools' relevance and completeness. To evaluate reliability, the test-retest method was employed. The internal consistency of the tools was assessed using Cronbach's alpha coefficients, resulting in the following reliability scores: **Tool (I):** 0.753, **Tool (II):** 0.801, **Tool (III)**: 0.745, **Tool (IV):** 0.713, **Tool (V):** 0.851, **Tool (VI):** 0.793, and **Tool (VII)**: 0.789.

Ethical considerations:

Prior to beginning the study, the researchers sought consent from both the women and maternity nurses, following the guidelines set by the Faculty of Nursing Ethical Research Committee. They ensured participants that their data would be kept private, secure, and confidential. The women were also informed that participation was voluntary, with the option to withdraw from the study at any time, for any reason.

Administrative Design:

Prior to commencing the study, an official letter of permission was obtained from the Dean of the Faculty of Nursing at Tanta University. This letter was subsequently submitted to the Director of the study setting for approval to proceed with the research. The letter outlined the study's goals and emphasized the importance of cooperation and support in collecting data. Gaining administrative approval was crucial for ensuring the research could be conducted smoothly within the study setting.

A pilot study:

To ensure the tools' relevance, clarity, and the required time for completion, a pilot study was conducted with 10% of the total sample, consisting of 6 nurses and 12 parturient women. Based on the results of the pilot study, necessary adjustments were made. The full sample of the study was not involved in the pilot phase."

Field Work:

To develop a deep understanding of the research problem, the researchers conducted a detailed review of both local and international literature before creating the study tools. The fieldwork took place over a six-month period, from July to December 2024. The researchers visited the study site three times a week during the morning shift (9:00 AM – 1:00 PM). They introduced themselves to the medical and nursing staff, explained the purpose of the study in detail, and sought their cooperation to ensure the smooth progress of the research.

Phases of Study Implementation

Assessment Phase:

- The researchers met individually with each maternity nurse to gather socio-demographic information and assess their knowledge and practices concerning the intrapartum clinical pathway prior to the intervention (Pretest).
- The researchers personally met with each parturient woman, introduced themselves, explained the study's objectives, obtained her informed consent, and recorded socio-demographic information."

Planning Phase

-Researchers organized structured ICP structured intervention for maternity nurses, incorporating lectures, hands-on demonstrations, and role-playing scenarios to simulate real-life labor situations.

-The structured intervention focused on critical thinking, decision-making skills, and communication strategies to improve maternal care quality.

-Educational Handouts and Visual Aids:

-Nurses received printed handouts, posters, and digital presentations summarizing the clinical pathway steps.

-Visual aids, such as flowcharts and step-by-step care protocols, were provided for easy reference during labor management.

-Customization for Local Context:

-The clinical pathway materials were adapted to align with hospital policies,

cultural considerations, and available resources**.**

-Feedback from senior nurses and obstetricians was gathered to refine the materials before implementation.

-This structured approach ensured that maternity nurses were well-prepared to implement the clinical pathways effectively, leading to improved labor outcomes as well as maternal satisfaction.

"The Intrapartum Clinical Pathway (ICP) included the following components:"

-Parturient Women's care: This involved both physical and psychological assessments, as well as the application of intrapartum nursing interventions, including medication administration, fetal monitoring, positioning, pushing techniques, education (covering topics like walking, nutrition during labor, pushing techniques, positioning, and mother-newborn bonding), and the development of a discharge plan.

-**Newborn care**: This involved assessing the newborn and providing early infant care, including the Apgar score, cord care, eye care, temperature regulation, identification, and encouraging mother-child bonding by advising mothers to have skin-to-skin contact with their newborns immediately after delivery.

Implementation phase:

- The researchers organized a theoretical educational session for maternity nurses on the clinical pathway, lasting around 45–60 minutes. The session included a booklet and a PowerPoint presentation, addressing important topics such as the definition, importance, components, and the nursing role in the implementation of the clinical pathway.
- The researchers offered a detailed, step-by-step explanation of the intrapartum clinical pathway using educational videos as a teaching tool. This training was delivered over two sessions to 12 groups, each comprising five maternity nurses responsible for intrapartum care. Each session lasted between 45 and 60 minutes.
- The researchers applied the intrapartum clinical pathway in accordance with the intrapartum care pathway guidelines provided by the National Institute for Health and Care Excellence (NICE, 2020) and the recommendations from the World Health Organization (WHO, 2018). **These guidelines covered the following aspects:**
- The assessment included evaluating the women's physical and psychological conditions, monitoring the fetus's well-being, and ensuring effective communication and emotional support.
- The implementation of intrapartum nursing care covered all four stages of labor, including care during the first (latent and active phases), second (delivery), third (placental expulsion), and fourth (immediate postpartum) stages to ensure comprehensive maternal and fetal well-being.

First Stage of Labor Care:

- **Supportive Care & Information:** Offer continuous individual support, clarify to the woman the anticipated length of the first stage of labor, and reassure her that she is allowed to drink fluids. Suggest isotonic drinks, as they could be more beneficial than water.
- **Observation:** Adhere to the World Health Organization (WHO) guidelines by utilizing a partogram to track labor progress. Document observations such as contraction frequency every 30 minutes, pulse every hour, temperature and blood pressure every 4 hours, urine output frequency, and vaginal examinations every 4 hours (if allowed).
- **Pain Relief Measures:** Teach women breathing techniques, relaxation, and distraction strategies to help manage pain. Additionally, offer massages to provide comfort and alleviate discomfort.
- **Fetal Monitoring:** Perform intermittent auscultation of the fetal heart rate immediately after each contraction for at least one minute, ensuring monitoring is done at least every 15 minutes.

Second Stage of Labor Care:

-**Providing Information:** Inform the woman about the second stage of labor, explaining what she can anticipate and how to effectively cope with it.

-Observation: Evaluate the woman's emotional and psychological state to offer suitable support and reassurance.

-Fetal Monitoring: Carry out intermittent auscultation of the fetal heart rate for a minimum of one minute immediately following a contraction, ensuring checks occur at least every five minutes. Additionally, palpate the woman's pulse every 15 minutes to distinguish between maternal and fetal heart rates.

-Positioning & Pushing: Support the woman in choosing a position that feels most comfortable for her, while discouraging the lying-down position. Advise her to follow her natural urge to push, and if pushing is not effective, offer instruction on correct pushing techniques

Third Stage of Labor Care:

-Providing Information & Support: Explain the third stage of labor to the woman, including what to expect during this phase. Provide emotional support and reassurance throughout the process.

-Observation: Monitor the woman's overall physical status by assessing skin color, breathing, pulse, blood pressure, and vaginal blood loss to ensure her condition remains stable.

- **Providing Care:** Carry out key procedures including clamping the umbilical cord, administering a uterotonic medication to promote uterine contractions, and offering perineal care. Carefully examine the placenta, assess for any perineal tears, and assist with repair if necessary.

Intrapartum Newborn Care:

-Newborn Assessment & Immediate Care: Perform a comprehensive evaluation of the newborn, including

effective suctioning, Apgar scoring, and monitoring of vital signs.

-Essential Procedures: Provide cord care and eye care, and measure the newborn's weight, length, and head circumference. Regularly monitor the infant's temperature to ensure thermal stability.

-Mother-Baby Bonding: Promote immediate skin-to-skin contact between the mother and baby right after birth to facilitate bonding and support early breastfeeding.

-Fourth Stage of Labor Care:

-Providing Information: Inform the woman about the fourth stage of labor, outlining the recovery process and what to expect during the postpartum period.

-Observation & Assessment: Monitor the woman's vital signs, including temperature, pulse, and blood pressure. Assess uterine contractions, lochia, perineal condition, and overall physical recovery. Also, evaluate her emotional and psychological reaction to labor and childbirth.

-Postpartum Care: Teach the woman about the importance of regularly emptying her bladder to prevent potential complications.

-Mother-Newborn Bonding: Encourage breastfeeding to begin as soon as possible, preferably within the first hour after birth. Support continuous mother-baby contact, ensuring no separation during this important bonding time.

-After the educational sessions, maternity nurses carried out all steps of the clinical pathway for the study group of intrapartum women and their newborns. Each woman and her newborn received care from a single maternity nurse, while the researchers monitored and evaluated the process using a structured checklist.

-Each mother received a brochure with key information designed to support learning and application, aiming to improve their understanding and practices related to intrapartum and postpartum care.

-Maternity nurses documented all nursing interventions provided to parturient women, ensuring a suitable environment with proper lighting and privacy. They also actively engaged women in the decision-making process concerning their care.

-Parturient women in the control group received only the standard routine care offered by the hospital, without the extra interventions provided by the clinical pathway.

Evaluation phase:

The researchers assessed the effectiveness of the clinical pathway by evaluating nurses' performance, labor outcomes and maternal satisfaction in the study group (intrapartum clinical pathway group). These findings were then compared with the control group, which received routine hospital care, to evaluate effectiveness of standardized intrapartum clinical pathway nursing interventions on maternity nurses' performance, labor outcomes, and maternal satisfaction.

Statistical analysis

Before analysis, the collected data was systematically organized, reviewed, coded, and counted. For qualitative variables, descriptive statistics such as percentages and frequencies were used. A significance test was performed to compare the two groups, with statistical interpretations as follows: $P > 0.05$ (no significant difference), $P < 0.05$ (significant difference), $P < 0.01$ (highly significant difference), and $P < 0.001$ (very highly significant difference).

Results

Table (1): Illustrates that half of the nurses were aged between 20 and 29, with 46.7% possessing a bachelor's degree in nursing. Regarding work experience, 36.7% had between five and ten years of experience.

Table (2): Demonstrates a notable improvement in maternity nurses' knowledge of all aspects of the postpartum clinical pathway, including its definition, importance, components, and the nursing role, following the intervention compared to before. This improvement was statistically significant ($p = .000$). After the intervention, a higher percentage of nurses correctly answered all questions: 88.3% for the definition, 93.3% for the importance, 91.6% for the components, and 93.3% for the nursing role.

Figure (1): Shows a remarkable enhancement in maternity nurses' overall knowledge of the intrapartum clinical pathway after the intervention. The proportion of nurses with satisfactory knowledge increased significantly, from 16.5% before the intervention to 91.3% afterward, demonstrating a substantial improvement.

Table (3): Indicates a statistically significant improvement in nurses' practices across all areas of intrapartum care after the clinical pathway was implemented, in comparison to the period before its application. However, no significant difference was noted in the administration of uterotonic drugs or the positioning of women during the second stage of labor ($P > 0.05$).

Table (4): Reveals a statistically significant enhancement ($P = .000$) in nurses' practices concerning all aspects of intrapartum newborn care after the clinical pathway was implemented, in contrast to their practices before the pathway was applied.

Figure (2): Shows a marked improvement in maternity nurses' practices following the clinical pathway implementation. After the pathway was applied, 93.7% of nurses effectively carried out intrapartum care for women, a significant increase from 35.4% before. Similarly, 90% of nurses provided proper intrapartum newborn care after the application, up from 34% prior to its introduction. These findings emphasize the clinical pathway's positive influence on enhancing nurses' adherence to best practices in both maternal and newborn care.

Table (5): Shows that there were no statistically significant differences in demographic characteristics between

the clinical pathway group and the routine care group, except for the factor of residence, which had a statistically significant difference (P = .023).

Table (6): Emphasizes that the women in the clinical pathway group had a significantly higher level of knowledge about crucial labor-related factors like diet, pain relief measures, and activity (walking). Specifically, 66.7%, 70%, and 88.3% of these women were knowledgeable in these areas, whereas the routine care group showed much lower percentages of 23.3%, 28.3%, and 25%, respectively. The statistical difference between the two groups was highly significant (p = .000).

Table (7): Indicates a substantial difference between the intrapartum clinical pathway group and the routine care group in their practices related to pain relief measures, pushing technique, and positioning technique. In the clinical pathway group, 94.4% of women utilized pain relief measures correctly, 70% applied the proper pushing technique, and 100% adopted the correct positioning technique. Conversely, only 23.8%, 25%, and 96.7% of women in the routine care group exhibited similar practices. Despite these differences, there was no significant disparity between the two groups regarding mother-newborn bonding (P = .817).

Figure (3): Highlights the differences in pain intensity between the two groups. In the clinical pathway group, 65% of women reported moderate pain, significantly higher than the 43% in the routine care group. Furthermore, only 8% of women in the clinical pathway group experienced severe pain, compared to 38% in the routine care group, indicating that women in the clinical pathway group generally experienced less severe pain during labor.

Table (8): Illustrates that the implementation of clinical pathway care positively impacted labor outcomes, as reflected in a significantly shorter first stage of labor and a lower cesarean section rate in the study group compared to the control group.

Table (9): Demonstrates a significant difference in neonatal outcomes between the study and control groups. Newborns in the study group had higher mean birth weights and no admissions to the PICU, while 16.7% of newborns in the control group required PICU care. Early initiation of breastfeeding was more common in the study group (83.3%) compared to the control group (50%). Additionally, 100% of mothers in the study group successfully initiated breastfeeding, while 33.3% in the control group faced difficulties. These differences were statistically significant.

Table (10): Displays significant improvements in maternal satisfaction between the routine care group and the clinical pathway group across three areas. In the routine care group, satisfaction was lower, with 37% expressing contentment with interpersonal care, 28% with information and decision-making, and

35% with the birth environment. In contrast, in the clinical pathway group, satisfaction was higher: 67% with interpersonal care, 73% with information and decision-making, and 59% with the birth environment. These differences were statistically significant ($p = .000$), indicating that the clinical pathway significantly increased women's satisfaction with intrapartum care.

Table (1): Percent distribution of the maternity nurses according to their personal characteristics (n= 60)

Items	The study group (n= 60)	
	No.	%
Age / years		
-20 – 29	30	50
-30 – 39	22	36.7
-40 – 49	6	10
-50 – 60	2	3.3
Educational level		
- Secondary school (diploma).	20	33.3
-Technical Institute of Nursing.	10	16.7
- Bachelor's degree.	28	46.7
- Master's Degree.	2	3.3
- Doctorate Degree.	0	0
Years of Experience		
-<5	18	30
-5-<10	22	36.7
- 10-15	14	23.3
-More than 15 -	6	10

Table (2): Percent distribution of the maternity nurses according to their knowledge before and after clinical pathway implementation. (n= 60)

Items	The study group (n= 60)				X^2	P value
	Pre (n=60)		Post (n=60)			
	No.	%	No.	%		
Definition of intrapartum clinical pathway						
Correct and complete answers	4	6.7	53	88.3	94.07	.000
Correct and incomplete answers	1	1.7	5	8.3		
Incorrect answers or don't know	55	91.6	2	3.4		
Importance of intrapartum clinical pathway in women and newborn care						
Correct and complete answers	4	6.7	56	93.3	98.21	.000
Correct and incomplete answers	3	5.0	4	6.7		
Incorrect answers or don't know	53	88.3	0	0.0		
Components of intrapartum clinical pathway						
Correct and complete answers	2	3.3	55	91.6	106.94	'106.94
Correct and incomplete answers	2	3.3	4	6.7		
Incorrect answers or don't know	56	93.4	1	1.7		
Standardized intrapartum clinical pathway nursing intervention			56	93.3		
Correct and complete answers	9	15.0	4	6.7	76.54	.000
Correct and incomplete answers	14	23.3	0	0.0		
Incorrect answers or don't know	37	61.7				

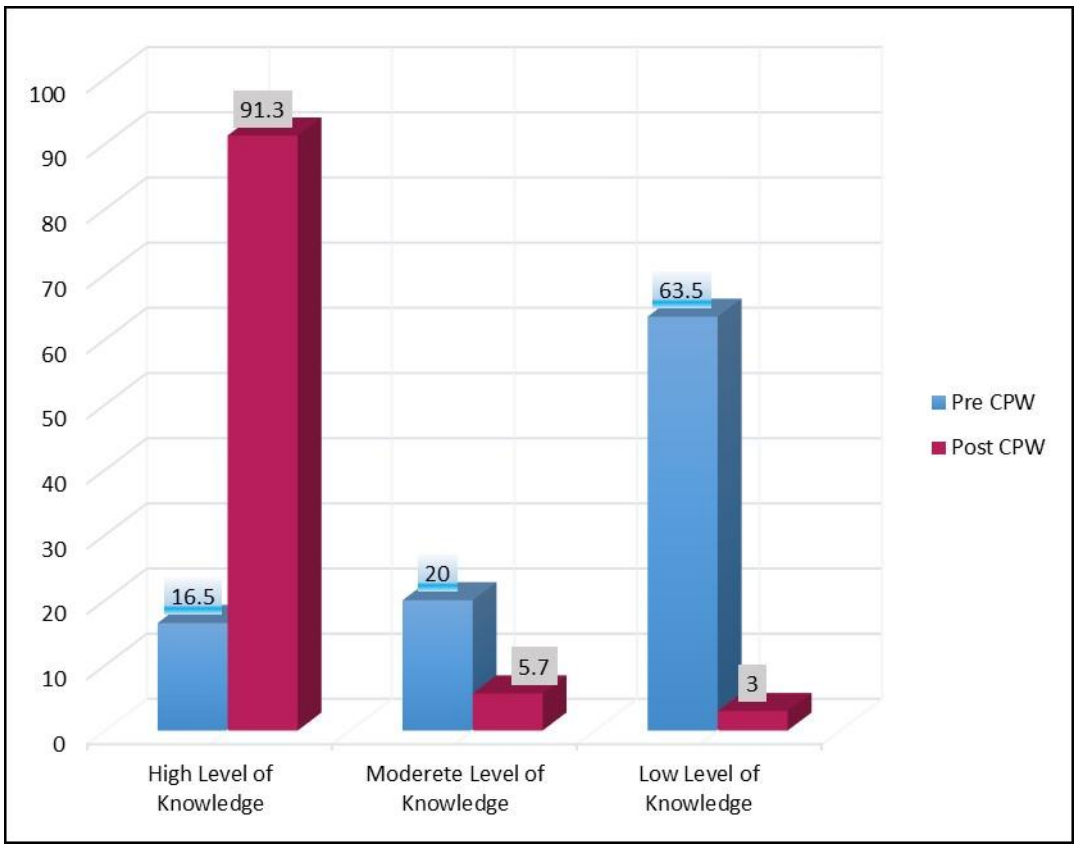

Figure (1): Percent distribution of maternity nurses according to their total score level of knowledge before and after clinical pathway implementation. (n= 60)

Table (3): Percent distribution of maternity nurses according their practices regarding care of parturient women before and after clinical pathway implementation. (n= 60)

Items	Before						After						X^2	P-value
	Correct and competently done		Correct and incompetently done		Not done or done incorrectly		Correct and competently done		Correct and incompetently done		Not done or done incorrectly			
	No	%	No	%	No	%	No	%	No	%	No	%		
Communication	32	53.3	28	46.7	0	0.0	56	93.3	4	6.7	0	0.0	24.54	.000
Support	37	61.7	0	0.0	23	38.3	58	96.7	0	0.0	2	3.3	22.28	.000
Care during the first stage of labor														
Assessment	18	30.0	42	70.0	0	0.0	53	88.3	7	11.7	0	0.0	57.41	.000
Pain relief measures	4	6.7	6	10.0	50	83.3	52	86.7	8	13.3	0	0.0	91.42	.000
Fetal monitoring	4	6.7	8	13.3	48	80.0	55	91.7	4	6.7	1	1.6	89.14	.000
Mobilization and diet	20	33.3	0	0.0	40	66.7	59	98.4	0	0.0	1	1.6	56.61	.000
Hygienic measure	2	3.3	4	6.7	54	90.0	50	83.4	2	3.3	8	13.3	79.10	.000
Care during the second stage of labor														
Observation (Assessment)	6	10.0	54	90.0	0	0.0	58	96.7	2	3.3	0	0.0	90.53	.000
Uterotonic drug (Oxytocin) administration	57	95.0	3	5.0	0	0.0	60	100	0	0.0	0	0.0	3.077	.079
Pain relief measures	4	6.7	6	10.0	50	83.3	45	75.0	3	5.0	12	20.0	58.59	.000
Fetal monitoring	2	3.3	3	5.0	55	91.7	51	85.0	2	3.3	7	11.7	82.66	.000
Woman positioning	58	96.7	0	0.0	2	3.3	60	100	0	0.0	0	0.0	2.034	.154
Pushing technique	50	83.3	0	0.0	10	16.7	60	100	0	0.0	0	0.0	10.90	.001
Care during the third stage of labor														
Observation(assessment)	10	16.6	25	41.7	25	41.7	56	93.3	4	6.7	0	0.0	72.26	.000
Uterotonic drug administration	57	95.0	3	5.0	0	0.0	60	100.0	0	0.0	0	0.0	3.077	.079
Perineal care	7	11.7	53	88.3	0	0.0	50	83.3	10	16.7	0	0.0	61.78	.000
Placenta	12	20.0	36	60.0	12	20.0	51	85.0	2	3.3	7	11.7	55.88	.000

examination														
Initial assessment of perineum	3	5.0	2	3.3	55	91.7	47	78.4	10	16.6	3	5.0	90.67	.000
Assist in perineal repair.	55	91.7	5	8.3	0	0.0	60	100	0	0.0	0	0.0	5.217	.022
Care during the fourth stage of labor														
Vital signs	50	83.3	10	16.7	0	0.0	60	100.0	0	0.0	0	0.0	12.11	.001
Uterine contraction and lochia assessment	3	5.0	5	8.3	52	86.7	51	85.0	3	5.0	6	10.0	79.64	.000
Woman's emotional and psychological condition assessment	6	10.0	0	0.0	54	90.0	50	83.3	0	0.0	10	16.7	64.82	.000
Perineum assessment	10	16.7	2	3.3	48	80.0	53	88.4	2	3.3	5	8.3	64.23	.000
Mother and baby bonding	6	10.0	0	0.0	54	90.0	51	85.0	0	0.0	9	15.0	67.66	.000

Table (4): Percent distribution of maternity nurses according their practices regarding intrapartum newborn care before and after clinical pathway implementation. (n= 60)

Items	Before						After						X^2	P-value
	Correct and competently done		Correct and incompetently done		Not done or done incorrectly		Correct and competently done		Correct and incompetently done		Not done or done incorrectly			
	No	%	No	%	No	%	No	%	No	%	No	%		
Assessment of Newborn	7	11.7	53	88.3	0	0.0	51	85.0	9	15.0	0	0.0	64.60	.000
Suctioning	48	80.0	12	20.0	0	0.0	60	100.0	0	0.0	0	0.0	13.33	.000
Apgar score	4	6.7	20	33.3	36	60.0	40	66.7	9	15.0	11	18.3	44.66	.000
Cord care	51	85.0	9	15.0	0	0.0	60	100.0	0	0.0	0	0.0	9.73	.002
Eye care	8	13.3	5	8.3	47	78.4	53	88.3	1	1.7	6	10.0	67.58	.000
Measurements	5	8.3	55	91.7	0	0.0	52	86.7	8	13.3	0	0.0	73.81	.000
Body temperature	17	28.3	3	5.0	40	66.7	58	96.7	2	3.3	0	0.0	62.61	.000
Vitamin k administration	43	71.7	17	28.3	0	0.0	59	98.3	1	1.7	0	0.0	16.73	.000
Identification	8	13.3	2	3.3	50	83.4	53	88.3	0	0.0	7	11.7	67.63	.000

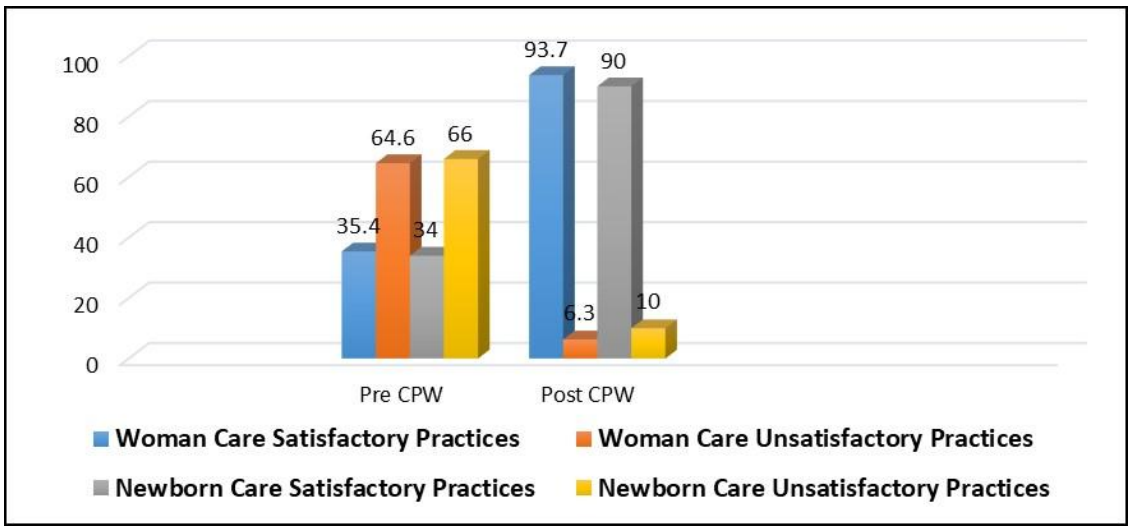

Figure (2): Percent distribution of maternity nurses according to their total score level of practices (woman and newborn care) before and after clinical pathway implementation. (n= 60)

Table (5): Percent distribution of parturient women according to their personal characteristics (n=120)

Items	Clinical Pathway group ((N=60)		Routine Care group (N=60)		X^2	p-value
	No.	%	No.	%		
Age / years						
20 – 25	26	43.3	19	31.7		
25 – 30	16	26.7	23	38.3	3.61	.46
30 – 35	12	20	14	23.3		
35-40	5	8.3	4	6.7		
40-45	1	1.7	0	0		
Educational Level						
Read and write	11	18.3	13	21.7	.548	.76
Secondary	31	51.7	27	45.0		
University	18	30.0	20	33.3		
Residence						
Urban	32	53.3	44	73.3	5.16	.023
Rural	28	46.7	16	26.7		

Table (6): Percent distribution of parturient women according to their knowledge regarding IPC among the both groups. (n=120)

Items	Clinical Pathway group (n=60)		Routine Care group (n=60)		X^2	P value
	No	%	No	%		
Diet during labor						
Correct and complete answers	40	66.7	14	23.3	**22.88**	**.000**
Incorrect answers or don't know	20	33.3	46	76.7		
Pain relief measures						
Correct and complete answers	42	70.0	17	28.3	**32.77**	**.000**
Incorrect answers or don't know	18	30.0	43	71.7		
Activity (Walking)						
Correct and complete answers	53	88.3	15	25.0	**57.33**	**.000**
Incorrect answers or don't know	7	11.7	45	75.0		

Table (7): Percent distribution of parturient women according to their practices regarding IPC among the both groups. (n=120)

Items	Clinical Pathway group (n=60)		Routine Care group (n=60)		X^2	p-value
	No.	%	No.	%		
Pain relief measures						
Yes	36	60.0	21	35.0	**7.519**	**.006**
No	24	40.0	39	65.0		
If Yes						
Adequately done	34	94.4	5	23.8	**36.56**	**.000**
Inadequately done	2	5.6	16	76.2		
Pushing technique						
Yes	100	100.0	100	100.0	-	-
No	0	0.0	0	0.0		
If yes						
Adequately done	42	70.0	15	25.0	24.36	.000
Inadequately done	18	30.0	45	75.0		
Positioning technique					-	-
Yes	100	100.0	100	100.0		
No	0	0.0	0	0.0		
If yes						
Adequately done Inadequately done	60	100.0	58	96.7	2.034	.154
	0	0.0	2	3.3		
Mother-newborn bonding						
Yes	100	100.0	100	100.0	-	-
No	0	0.0	0	0.0		
If Yes						
Positive	49	81.7	47	78.3	**.054**	**.817**
Negative	11	18.3	13	21.7		

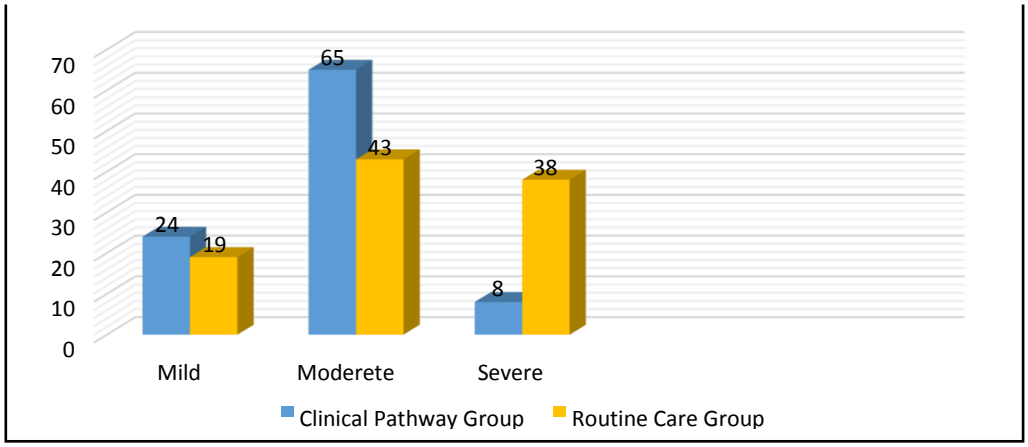

Figure (3): Percent distribution of parturient women according to their pain level among both groups. (n=120)

Table (8): Distribution of parturient women according to maternal outcomes assessment regarding ICP among both groups. (n=120).

Variables	Study group N=60		Control group N=60		X2	P value
	No.	%	No.	%		
Duration of the first stage of labor						
< 8 hours	50	83.3	22	36.7	9.30	**0.010***
8 – 12 hours	10	16.7	16	26.6		
> 12 hours	0	0.00	22	36.7		
Duration of the second stage of labor						
Less than 20 minutes	**60**	100	60	100	-	-
Type of delivery						
Vaginal	60	100.0	38	63.3	0.104	0.01
Caesarian	0	0.0	22	36.7		
Causes of caesarian delivery	**N=0**		**N=22**			
Rupture of membrane	0	0.00	10	45.5		
Oligohydramnios	0	0.00	3	13.6		0.04
Wrap the umbilical cord around fetus	0	0.00	4	18.2	9.64	
Bleeding	0	0.00	2	9.1		
Preeclampsia	0	0.00	2	9.1		
Twin	0	0.00	1	4.5		

Table (9): Distribution of parturient women according to neonatal outcomes assessment regarding ICP among both groups. (n=120).

Variables	Study group		Control group		X2	P value
	No.	%	No.	%		
APGAR score					t	
Mean ±SD	9.76±0.83		9.72±0.79		0.391	0.695
Range	7-10		7-10			
Weight in Kg					t	
Mean ±SD	3.20±0.36		3.10±0.50		1.10	0.02
Range	2-4.50		2-4.00			
Need for PICU					FE	
Yes	0	0.00	10	16.7	0.22	0.01
No	60	100.0	50	83.3		
Time of starting breastfeeding						
After birth	50	83.3	30	50.0		
Within 12 hours after birth	10	16.7	19	31.7	1.48	0.03
After 12 hours	0	0.0	11	18.3		
Has breastfeeding started well?						
Yes	60	100.0	40	66.7	FE	0.05
No	0	0.00	20	33.3	0.35	

Table (10): Percent distribution of parturient women according to their maternal satisfaction towards intrapartum care among the both groups. (n=120)

Domain	Clinical pathway group (n=60)			Routine care group (n=60)			X^2	p-value
	Mean Standard	Satisfaction	Dissatisfaction	Mean Standard	Satisfaction	Dissatisfaction		
IPC	23.18 2.19	67%	33%	22.16 3.11	37%	63%	30.3	0.000
IDM	16.20 3.31	73%	27%	15.21 3.31	28%	72%		
PBE	23.43 2.04	59%	41%	21.53 3.01	35%	65%		

Discussion

Clinical pathways are becoming a widely recognized method for integrating evidence-based practices into healthcare systems. They provide a clear structure for collaborative decision-making and synchronized patient care within a specified period. The primary objective of clinical pathways is to improve the overall quality of healthcare by focusing on enhancing patient outcomes, promoting safety, increasing patient satisfaction, and optimizing resource allocation **(World Health Organization, 2023; Ismail, 2012**). This study was designed to evaluate effectiveness of standardized intrapartum clinical pathway nursing interventions on maternity nurses' performance, labor outcomes, and maternal satisfaction.

The study's findings on the demographic characteristics of maternity nurses showed that a significant portion of the nurses were aged between 20 and 29 years, with 5 to 10 years of experience, and half held a bachelor's degree. A smaller proportion had a nursing diploma. This underscores how age can influence patient care practices and highlights the importance of formal education in shaping the nurses' professional skills and expertise.

These findings are in line with **Al-Taee (2016)**, who found that most nurses were less than 35 years old, with about five years of experience, further supporting the idea that younger, well-educated nurses contribute positively to care delivery.

The results of this study demonstrated a significant improvement in nurses' knowledge regarding all aspects of the intrapartum clinical pathway, including its definition, importance, components, and nursing role, after the intervention ($p = .000$). The knowledge gap before the intervention could be attributed to a lack of continuous education and insufficient motivation to stay updated. The improvement observed highlights the effectiveness of the educational intervention provided by the researchers.

These findings are consistent with studies by **Sarikhani, Y., Najibi, S. M., & Razavi, Z. (2024) and Devi and Latha Venkatesan (2012),** who found that nurses' knowledge significantly improved in post-test assessments compared to pre-tests, emphasizing that teaching unfamiliar concepts enhances both knowledge and practices.

Similarly, the findings align **with Abd El-Hay et al., (2019)**, who reported a significant increase in the total mean knowledge score regarding the clinical pathway after program implementation.

The study's results revealed a statistically significant improvement ($p = .000$) in maternity nurses' practices regarding all aspects of the

intrapartum clinical pathway following the intervention. This indicates that the training sessions were effective in enhancing nurses' clinical performance. These findings align with those of **Devi and Latha Venkatesan (2012)**, who reported a significant increase in nurses' practice scores after the clinical pathway intervention (M = 232.8, SD = 7.88).

Similarly, **Mahmoud and Abd-ElSadik (2013)** emphasized the crucial role of nurses in clinical pathway practices, noting that they are responsible for initiating and completing the patient care process.

Furthermore, **Das (2017)** found that a structured training program aimed at improving nurses' childbirth-related skills led to a substantial increase in the adoption of essential delivery practices, while also reducing unnecessary or harmful interventions.

The findings of this study revealed a statistically significant difference in Apgar scores between the Clinical Pathway intervention group and the control group. This aligns with the study by **Abushaikha and Oweis (2015)**, which explored Jordanian pregnant women's expectations of their first childbirth experience and found that newborns whose mothers received support during labor had fewer admissions to intensive care units.

Additionally, the present study found that the Clinical Pathway intervention group implemented early attachment as a comfort measure during labor, which aligns with the research by **Christianes and Bracke (2017)** in their assessment of social psychological determinants of satisfaction with childbirth. Their study highlighted the significance of early mother-infant contact, emphasizing its role as a beneficial practice that should be promoted for low-risk and normal deliveries.

The findings of this study revealed that women in the Clinical Pathway group had a higher level of knowledge regarding proper nutrition during labor, pain relief techniques, and physical activity compared to those who received routine care. This suggests that education played a crucial role in improving women's understanding of intrapartum care. These results are consistent with the study by **Valiani et al. (2014)**, which reported a statistically significant increase in mothers' knowledge about childbirth care after the intervention, compared to before.

Building on the previous findings, **El-Baz (2008) and El-Hadary (2009)** found that participants in the nursing clinical pathway had significantly higher knowledge scores compared to the control group. This improvement in knowledge may be attributed to the emphasis on patient and family education during the clinical pathway implementation. Such education positively impacted

patient recovery and contributed to earlier hospital discharge, reinforcing the importance of education in enhancing patient outcomes.

In line with these findings, **Abd-El-Rhman (2001)** reported a significant improvement in both the quality of care and patients' knowledge levels following the implementation of the clinical pathway. The study also highlighted that providing an educational booklet helped patients better understand their daily hospitalization expectations, which in turn reduced anxiety related to their illness and hospital stay.

Moreover, these studies highlight the critical role of maternal education in improving pregnancy outcomes. **Zachary et al. (2013)** emphasize that many pregnant women lack vital information about maintaining a healthy pregnancy, particularly when it comes to lifestyle choices such as nutrition and physical activity. This lack of knowledge can hinder effective pregnancy management and health outcomes. **Olagbuji et al. (2013)** further stress the importance of educating women on fetal movement patterns during pregnancy. They found that insufficient knowledge about fetal movements could delay the identification of potential issues, such as abnormal movements, which can contribute to preventable stillbirths. These findings reinforce the need for structured educational programs during prenatal care to equip women with the information necessary for making informed decisions about their health and the health of their baby.

Moreover, the study by **O'Connell et al. (2017)** further supports the importance of antenatal education by showing that women who participated in structured prenatal classes reported greater satisfaction with their childbirth experience, increased confidence, and reduced fear during labor.

Similarly, **Dahlen et al. (2013)** found that women who received comprehensive education about pain management and delivery techniques were more likely to use non-pharmacological pain relief strategies and had better birth outcomes. These findings consistently reinforce that antenatal education not only enhances maternal knowledge but also plays a crucial role in improving labor experiences and outcomes, aligning with the positive effects seen in clinical pathway interventions.

In addition, these findings align with the work of **Howarth & Swain (2019)**, who discovered that a self-directed, skills-based childbirth preparation program significantly boosted childbirth self-efficacy in first-time mothers. The current study's results, which demonstrated statistically significant improvements in the use of pain relief measures, pushing techniques, and positioning

among women following the intrapartum clinical pathway, further emphasize the importance of structured education in increasing women's competence and confidence in managing intrapartum care. **Patricia (2006)** similarly highlighted that clinical pathways provide standardized guidelines while still allowing flexibility for individual variations in provider actions and patient responses. This combination of structure and adaptability improves care delivery and leads to better patient outcomes.

The present study also revealed that the implementation of the intrapartum clinical pathway led to improvements in various aspects of care, including pain management, maternal satisfaction, and the adoption of best practices. By integrating structured guidelines and continuous support, the clinical pathway ensured that women received appropriate interventions at key stages of labor, resulting in better outcomes compared to routine care. These findings align with the work of Derricott & Crean (2016), who emphasized the role of clinical pathways in standardizing care, enhancing patient experiences, and improving both maternal and neonatal outcomes.

Additionally, clinical pathways can facilitate better communication among healthcare providers, ensuring that all team members are aligned in delivering the highest standard of care.

This finding is further supported by **the Ministry of Health (2019),** which emphasized that breathing exercises not only enhance relaxation but also improve pain tolerance by reducing anxiety and lowering catecholamine levels. Additionally, these exercises contribute to better uterine blood flow and help decrease muscle tension, all of which are crucial for a smoother labor process. These benefits underline the importance of incorporating relaxation techniques, such as controlled breathing, into clinical pathways to improve maternal comfort and outcomes during labor.

The findings indicate significant differences between the intervention and control groups regarding the application of comfort measures. This aligns with the research by **Lai et al. (2019)**, which demonstrated that breathing exercises promote relaxation, thereby increasing pain tolerance, reducing anxiety, lowering catecholamine levels, improving uterine blood flow, and alleviating muscle tension. These results further support the effectiveness of structured interventions, such as clinical pathways, in enhancing comfort and pain management during labor.

These findings also emphasize the importance of standardized interventions in improving labor

experiences. By equipping women with the necessary skills, such as effective breathing and pushing techniques, the clinical pathway not only helped reduce pain intensity but also contributed to a smoother progression of labor. This aligns with research that supports the role of education in empowering women to manage pain and make informed decisions about their care during childbirth. In addition, the positive outcomes in the experimental group underscore the value of personalized and evidence-based care strategies for improving maternal experiences.

The study's findings emphasize that maternal satisfaction with intrapartum care is significantly enhanced by the implementation of a clinical pathway, as evidenced by the statistically significant difference between the clinical pathway group and the routine care group ($p = .000$). The higher satisfaction levels in the clinical pathway group suggest that structured, evidence-based care leads to improved maternal experiences during labor.

These results are consistent with previous studies, such as those by **Devi & Latha Venkatesan (2012)**, which showed higher satisfaction scores in the experimental group compared to the control group, and Huang et al. (2015), who found increased satisfaction and shorter hospital stays with the use of clinical pathways. Further support comes from research in developing countries, like **Atiya (2016) and Khammamy et al. (2017),** which also highlighted the positive impact of structured care protocols on maternal satisfaction. Overall, these findings underline the importance of adopting clinical pathways to enhance the quality of care and improve women's childbirth experiences.

The study's results also emphasize the crucial role of education and standardized clinical pathways in improving not only the professional skills of maternity nurses but also the overall experience of women during labor and childbirth. The significant increase in nurses' knowledge and practices reflects the effectiveness of the educational sessions provided, which ultimately enhanced the quality of care. Furthermore, the positive outcomes observed in the clinical pathway group such as improved labor outcomes, higher maternal satisfaction, and better neonatal health demonstrate the value of a comprehensive, evidence-based approach to intrapartum care. These findings reinforce the importance of ongoing education and support for healthcare providers to ensure optimal care delivery in maternity settings.

Conclusion

The findings of the study indicated that the implementation of the intrapartum clinical pathway led to a

significant improvement in maternity nurses' knowledge and practices, which were demonstrated through higher post-intervention scores. The results also showed that labor outcomes and maternal satisfaction were considerably better in the clinical pathway group compared to those receiving routine care. This aligns with the study's aim and supports the research hypotheses (H1, H2, H3, and H4), confirming that the clinical pathway has a positive impact on the quality of care provided during labor. The statistically significant improvements (p = .000) in both knowledge and practice underscore the effectiveness of this standardized approach to intrapartum care.

Recommendations:

Based on the findings and conclusions of this study, the following recommendations are proposed:

-Enhance Nurse Training: Implement specialized training programs for maternity nurses on intrapartum care using clinical pathways to strengthen their knowledge and clinical skills.

-Integrate Clinical Pathways in Practices: Clinical pathways should be systematically applied during the intrapartum period to enhance women's knowledge, increase their satisfaction, reduce complications, and shorten hospital stays.

-Expand Research Efforts: Conduct further studies with larger and more diverse populations to validate the findings and ensure their broader applicability in different healthcare settings.

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