Effect of Breast Crawl Technique during Third Stage of Labor on Maternal and Neonatal Outcomes

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Abstract

Background: The breast crawl technique is a remarkable method that reduces maternal and neonatal morbidity as well as mortality. **Aim of the study**: The current study aimed to investigate the effect of breast crawl technique during third stage of labor on maternal and neonatal outcomes. **Study design:** A Quasi-experimental research design. **Study setting:** This study was conducted at labor unit of Obstetrics and Gynecology Department affiliated to Benha University Hospital. **Study sample:** A purposive sample of 130 parturient women divided equally into study group (65) and control group (65). **Tools of data collection:** Five tools were used: I) A structured interviewing questionnaire, II) Maternal clinical assessment sheet, III) Neonatal clinical assessment sheet, IV) Mother-to-Infant Bonding Scale and V) Maternal satisfaction regarding breast crawl technique. **Results:** The mean duration of third stage of labor was shorter in study group15.03 ± 7.16 minutes than control group 21.45 ± 8.23 minutes ($p \leq 0.001$), significantly decreased mean of blood loss among the study group 255.23 ± 21.80 ml compared to 320 ± 38.87 ml of the control group ($p \leq 0.05$)**.** Also, indicated that the mean score of immediate initiation of breastfeeding, infant breastfeeding competence and mother-to-infant bonding was significantly higher in study group compared to control group ($p \leq 0.05$ and $p \leq 0.001$) and more than two thirds of women in study group had high satisfaction regarding breast crawl technique. **Conclusion:** Breast crawl technique had positive effect on shorting duration of the third stage of labor, reducing blood loss, lowering episiotomy pain during suture, enhancing immediate initiation of breastfeeding, infant breastfeeding competence and strengthening bonding between mother and newborn. **Recommendations:** The breast crawl technique is recommended to be integrated with routine labor care to enhance maternal and neonatal outcomes.

Keywords: Brest Crawl Technique, Third Stage of Labor, Maternal and Neonatal Outcomes.

Introduction

Childbirth is a profound and life-changing experience for the mother, child, and family. It is not only a physical event, but also an emotional and psychological journey, filled with a variety of emotions such as excitement and anticipation followed by relief and happiness **(Nahaee et al., 2024).** Childbirth can also bring about feelings of anxiety, postpartum depression and post-traumatic stress disorder and challenges related to maternal mental health and sexual well-being. Additionally, it can impact breastfeeding, future childbearing decisions and the nature of subsequent births **(Çubukçu and Şahin, 2025).**

Labor is series of events that take place in the genital organs in an effort to expel the viable products of conception out of the womb through the vagina. Labor is divided

into four stages. The first stage begins from the onset of true labor pains and ends with full dilatation of the cervix. The second stage starts from the full dilatation of the cervix and ends with delivery of fetus from the birth canal. The third stage begins after the expulsion of the fetus and ends with delivery of the placenta and membranes. The fourth stage is the stage of early recovery; it begins after the expulsion of placenta and membranes lasts for two hours **(Meena, 2023).**

The third stage of labor is a vital phase in the childbirth process not only for the completing delivery but also for preventing potential complications such as postpartum hemorrhage, uterine atony and retention of the placenta. Traditionally, the management of third stage has relied heavily on pharmacological interventions particularly the administration of oxytocin which promotes uterine contractions and the expulsion of the placenta. In addition, many non-pharmacological interventions as skin- to-skin contact and breast crawl technique can prevent third stage complications because breast crawl technique naturally triggers the release of oxytocin in parturient woman **(Marwati, 2024).**

Brest crawl is the miraculous, natural and instinctive ability of the newborn to locate the mother’s breast. When the newborn placed on mother’s abdomen immediately after birth, the newborn crawls towards the breast looking for the mother’s nipples and self-attaches with efforts and starts breastfeeding **(Oktaviani et al., 2024).** The newborn cradles from the mother's abdomen towards the breast following a sequence of nine inborn behavioral patterns (birth cry, relaxation, awakening, activity, rest, crawling, familiarization, suckling and finally sleeping) **(Retni et al., 2024).**

The breast crawl technique is a remarkable method reduces maternal and neonatal morbidity as well as mortality. As the newborn is placed on the mother's abdomen, the stepping of foot on abdomen enhances uterine contractions which compresses the placenta and shrinks the mother's uterus. So that the placenta can be delivered quickly, minimizes blood loss and prevents postpartum hemorrhage. Also, breast crawl technique decreases the pain during episiotomy suture as it distracts mother's attention from the pain. In addition, breast crawl technique strengthens emotional bonding between mother and newborn **(Nair et al., 2022).**

Moreover, the breast crawl technique offers various benefits for newborns such as helping regulate body temperature and blood sugar levels, enhancing early suckling and rooting reflexes, allowing the newborn to develop effective breastfeeding skills more quickly. As well as, breast crawl technique prevents neonatal infections, supports the newborn's neurological development and fosters strong bonding between mother and newborn leading to less crying and greater comfort for the newborn **(Sharma et al., 2024).**

Significance of research:

Labor is a transformative experience which may carry serious complications for the mother and newborn especially during third stage of labor **(Yao et al., 2024**). According to World Health Organization, every day in 2020, almost 800 women died from preventable causes related to pregnancy and childbirth. Postpartum hemorrhage is the primary cause of maternal morbidity and

mortality, approximately 70,000 deaths worldwide annually, 3.2% in the United States, 16% in Nepal, 10.4% in China and 20% of all maternal deaths in Egypt **(World Health Organization, 2023).**

The first hour after birth is crucial for the newborn's survival, future health, and well-being. During this time, the newborn requires warmth, prevention of infections and breastfeeding **(Parmar et al., 2021).**The breast crawl technique is widely recognized as the most inherent, spontaneous, coherent and uncomplicated approach that can lower maternal and neonatal hazards and enhances the health of both the mother and newborn. Additionally, the consciousness, acceptability and practicability of the breast crawl as a routine practice in the delivery room remains a major challenge due to the lack of awareness, guidelines, training and hesitancy from the mothers, healthcare staff and inadequate staffing **(Dhanawade et al., 2024).**

According to **Moran et al., (2023)** founded that the practice of the breast crawl was 1% in Tanzania and 98% in Croatia and high-income nations had greater rates, but there was variation depending on the environment. Also, **Rana and Swain, (2022)** pointed out that the discrepancies in rates of breast crawl practice may be caused by an inconsistency in the terminology used to describe the breast crawl technique and the standards by which its onset and duration are evaluated.

In addition, the importance of breast crawl technique in preventing complications of third stage of labor, initiating immediate breastfeeding and reducing maternal and neonatal mortality rate. So, this study was conducted to investigate the effect of breast crawl technique during third stage of labor on maternal and neonatal outcomes.

Aim of research:

This study was aimed to investigate the effect of breast crawl technique during third stage of labor on maternal and neonatal outcomes.

Research Hypotheses:

H1: Parturient women who will apply breast crawl technique will have shorter duration of third stage of labor than those who don't apply it.

H2: Parturient women who will apply breast crawl technique will have lower blood loss and pain during episiotomy suture than those who don't.

H 3: Parturient women who will apply breast crawl technique will have immediate initiation of breastfeeding and enhanced infant breastfeeding competence than those who don't.

H 4: Parturient women who will apply breast crawl will have stronger postpartum bonding than those who don't.

Subjects and Method:

Research design:

A Quasi-experimental study design (non-equivalent groups design) was utilized to fulfill the aim of this study.

Research setting:

The study was conducted at labor unit of Obstetrics and Gynecology Department affiliated to Benha University Hospital. Benha university hospital is the one of the most important medical buildings at Qalioubia Governorate as it is the main hospital providing care for women with different social background and high risk women to the governorate and other surrounding governorates. This unit was located at the ground floor of the hospital which includes one examination room, one

prenatal room, one labor room and two postnatal rooms.

Research sampling:

Sample type: A Purposive sample was used to fulfill the aim of the study.

Sample size: A number of 130 parturient women were recruited in the current study. The sample size was represented 10 % of the total population of parturient women in the previous year of 2022 (1300 Parturient women) according to Benha university hospital statistical center **Benha University Hospital Statistical Center, [2022]**.Sample selected according to the following inclusion criteria: Primipara women, full- term (37-42 weeks of gestation), spontaneous vaginal delivery with conservative placental delivery, have a singleton viable fetus without any complications and with an Apgar score 7 and more, willing to participate in the study. Exclusion criteria: Have abnormalities of breast and nipple such as inverted and cracked nipple and newborns have any congenital anomalies interfering with breastfeeding.

Tools of data collection:

Five tools were used in this study:

Tool [I]: A structured interviewing questionnaire: This questionnaire was designed by the researchers after reviewing the related literature **(Dhanawade et al., 2024; Mohana et al., 2022; Parmer et al., 2021)** and was written in an Arabic language in the form of close ended questions and used to assess general characteristics of studied women as (age, educational level, occupation, residence) and obstetric history included (gestational age, number of abortion).

Tool [II]: Maternal clinical assessment sheet: it was developed by **Nair and Salunkhe, (2022)** and adapted by the researchers to assess physiological maternal outcomes. It was included three parts:

Part (1): Assessment the duration of third stage of labor, the researchers assessed the duration of the third stage of labor by starting the timing immediately after the complete delivery of the newborn. The researchers closely observed the parturient women for natural signs of placental separation such as a sudden gush of blood, lengthening of the umbilical cord, absence of umbilical cord pulsation and suprapubic plug with the uterus becoming firm and rising in the abdomen. The researchers accurately measured the duration of the third stage by subtracting the time of newborn's delivery from the time of complete placental delivery in minutes.

Part (2): Assessment amount of blood loss during the third stage of labor, it was assessed by the researchers on two phases; first phase was started by collecting the blood drained after the newborn delivery until the delivery of the placenta in a special calibrated container. Second phase was started by weighing the perineal pads pre and post the placental delivery and subtract both values and again add the difference to pre-determined drained blood and quantified blood loss as following:

- Mild =100 < 200 ml
- Moderate = 201< 500 ml
- Severe = ≥ 500 ml

Part (3): Visual analogue scale (VAS), it was a standardized linear scale adopted from **McCaffery and Pasero, (1999)**, to assess parturient woman's perception for pain intensity while episiotomy suture. The tool was a horizontal line divided by numbers from 0 (no pain) to 10 (worst pain possible) with equal distances (1 cm).

Scoring system:

The total score ranged from 0 to 10, the minimum score and representing "no pain" was (0). The maximum score and representing

"worst pain possible" was (10). The scores were categorized as following:

- No pain 0
- Mild pain 1-3
- Moderate pain 4-6
- Severe pain 7-9
- Worst pain possible 10

Tool [III]: Neonatal clinical assessment sheet, this tool used to assess neonatal outcomes and included two parts:

Part (1): Modified LATCH Scale: This scale was developed by **Jensen et al., (1994)** and adapted by the researchers to assess immediate initiation of breastfeeding after delivery. LATCH denoted five items (latching of the newborn onto the nipples, amount of audible swallowing, time of breastfeeding initiation, comfort of the mother and help needed by the mother to hold the newborn to the breast).

Scoring system:

Each item was scored as (2) good, (1) better and (0) worst. Total score ranged from 0 to 10 and was categorized as following:

- Worst 0-3
- Better 4-7
- Good 8-10

Part (2): Infant Breastfeeding Assessment Tool (IBFAT): it was developed by **Matthews, (1988)** and adapted by the researchers to assess infant breastfeeding competence. The IBFAT comprised four items: readiness of the newborn to breastfeed, rooting reflex, how long from placing newborn on breast to latch and suck and suckling pattern.

Scoring system:

Each item was evaluated on a four-point Likert scale (0-3). The total score was ranged from 0 to 12 and was categorized as the following:

- High risk 0 - 3
- Moderate risk 4 - 7
- Small risk 8 - 11
- Normal 12

Tool IV: Mother-to-Infant Bonding Scale (MIBS): this tool was developed by **Taylor et al., (2005)** and adapted by the researchers to assess the bonding formation in early relationship between mother and newborn. It was a self-reported scale that contained 8 items divided into 2 factors: lack of affection factor included four items, anger and rejection factor included four items**.**

Scoring system:

Responses were rated on a three-point Likert scale and were assigned as agree (2), uncertain (1), disagree (0) for the factor of "lack of affection" and reversed the score for the factor of "anger and rejection". The scores were summed for each factor. Total score ranged from 0 to 16 and was classified into:

- Weak bonding 0 - 5
- Medium bonding 6 – 11
- Strong bonding 12 - 16

Tool [V]: Maternal Satisfaction regarding breast crawl technique: this tool was developed by **Nair, (2022)** and adapted by the researchers to assess parturient woman's satisfaction regarding breast crawl technique two hours after labor and consisted of (11 items).

Scoring system:

Each item was rated on a 3-points Likert scale and was assigned as satisfied (3), neutral (2), dissatisfied (1). Total score of satisfaction was ranged from 11 to 33 and was categorized as following:

- High level of satisfaction ≥ 75% of total score (25-33).
- Moderate level of satisfaction 60% < 75% of total score (20-24).

- Low level of satisfaction < 60% of total score (11-19).

Tools validity and Reliability

Tools of data collection were reviewed by three panel expertise of obstetrics and gynecological nursing Benha University to ascertain content validity of tools. Modifications were done in the light of the valuable comments such as adding, rephrasing and omitting and modify some phrases which were inappropriate to the study inclusion criteria as replacing statement of "type of nipples" by "time of breastfeeding initiation" in Modified LATCH scale). Reliability of the tools was assessed by using Cronbach's alpha coefficient test which indicated that the five tools were moderate to high reliability. Internal consistency of Visual analogue scale (Tool II) was 0.85, internal consistency of Modified LATCH scale (Tool III (part 1) was 0.84, internal consistency of infant breastfeeding assessment tool (Tool III part 2) was 0.85, internal consistency of mother-to-infant bonding scale (Tool IV) was 0.80, internal consistency of maternal satisfaction regarding breast crawl technique (Tool V) was 0.86.

Ethical considerations:

Ethical aspects were considered before starting the study as the following: The study approval was obtained from scientific research ethical committee of the faculty of nursing at Benha University for fulfillment of the study. An official permission from the selected study settings was obtained for the fulfillment of the study. Before applying the tools, the researchers explained the aim and importance of the study to gain women's confidence and trust. The researchers took oral consent from women to participate in the study and confidentialities will be assured. The study didn't have any physical, social or psychological risks on the women. The study tools were ensured that the study didn't cause any harm for any women during data collection. Also didn't include any immoral statements and respect human rights time. The women were free to withdraw from study at any time without any reason. Also, the instructional brochure was provided to parturient women in the control group at the end of the study to benefit in subsequent labor.

Administrative approval:

A written official approval to conduct the study was obtained from the Dean of Faculty of Nursing to the director of Benha University Hospital and delivered to the director of the labor unit in order to obtain agreement to conduct the study after illustrating the title and its purpose.

Pilot study:

The pilot study was conducted on 10% of the total sample size (13 women) before starting data collection to test the clarity, objectivity, feasibility, relevance and applicability of the tools and to find out the possible obstacles and problems that might face the researchers and interfere with data collection. It also helped to estimate the time needed for data collection. No modifications were made. So, parturient women who shared in the pilot study were included in the main study sample.

Field work:

The researchers visited the previously mentioned setting three days/week, (Sundays, Tuesdays and Thursdays), from 9.00 am to 3:00 pm until the calculated sample size was obtained. Data collection was carried out from the beginning of January, 2024 and completed at the end of June, 2024 covering six months. To fulfill the aim of the study, the following phases were adopted: preparatory,

interviewing and assessment, implementation and evaluation phases.at the end of June, 2023 covering six months.

Preparatory phase:

This phase included reviewing current, local and international related literatures to help the researchers to be acquainted with magnitude and seriousness of the breast crawl technique and guided the researchers to prepare the require data collection tools and an instructional brochure about the breast crawl technique.

Interviewing and Assessment phase:

At the beginning of the individual interview the researchers greeted and introduced herself to each parturient woman included in the study, explained the aim of the study, provided the parturient women with all information about the study and took oral consent to participate in the study. The researchers assessed general characteristics and obstetric history of parturient women through interviewing the woman at pre-labor room during first stage of labor by using Tool I: A structured interviewing questionnaire. The average time was taken for completing this questionnaire was around 5 -10 minutes and the number of interviewed women was 4-6 women weekly.

Implementation phase:

For control group: The parturient women in the control group were received routine hospital care without any additional intervention.

For study group: breast crawl technique was applied during the third stage of the labor immediately after delivery of newborn, in addition to routine hospital care, the newborn was received in warm towel then the newborn's entire body (except for the hands to facilitate searching for breast) was dried with a soft cotton cloth and newborn was observed for any complications. Then the newborn was shown to the mother and kept close and the mother was enabled to kiss the newborn. The newborn was placed undressed except diaper in prone position on the mother's abdomen (nose of newborn in the middle of mother's breast, eyes at the level of the nipples). The newborn's head was covered with dry cap and warm blanket across back and the mother was instructed to hold newborn with both hands to prevent from slipping. The researchers observed the newborn's behavior in searching for the breast through nine stages that ended with finding the mother's breast and suckled from mother's nipple. These stages were (birth cry, relaxation, awakening, activity, rest, crawling, familiarization, suckling and sleeping) within each of these stages, the newborn exhibited a variety of actions to reach the nipple that lasted from 28 to 30 minutes. The stages were implemented as following **(Cong et al., 2023).** Birth cry stage: the newborn was cried immediately after birth, Relaxation stage: the newborn and mother were in skin to skin contact, Awakening stage: during this stage the newborn exhibited small thrusts of head and shoulders movements and opened eyes, Activity stage: the newborn showed suckling movements and looked at the breast, Rest stage: the newborn rested on the mother's breast, Crawling stage: the newborn reached the breast and catched the nipple with hands, Familiarization stage: the newborn became acquainted with the mother by licked the nipple, Suckling stage: newborn took the nipple, self-attached and started the breastfeeding and Sleeping stage: the newborn and mother had sleeped.

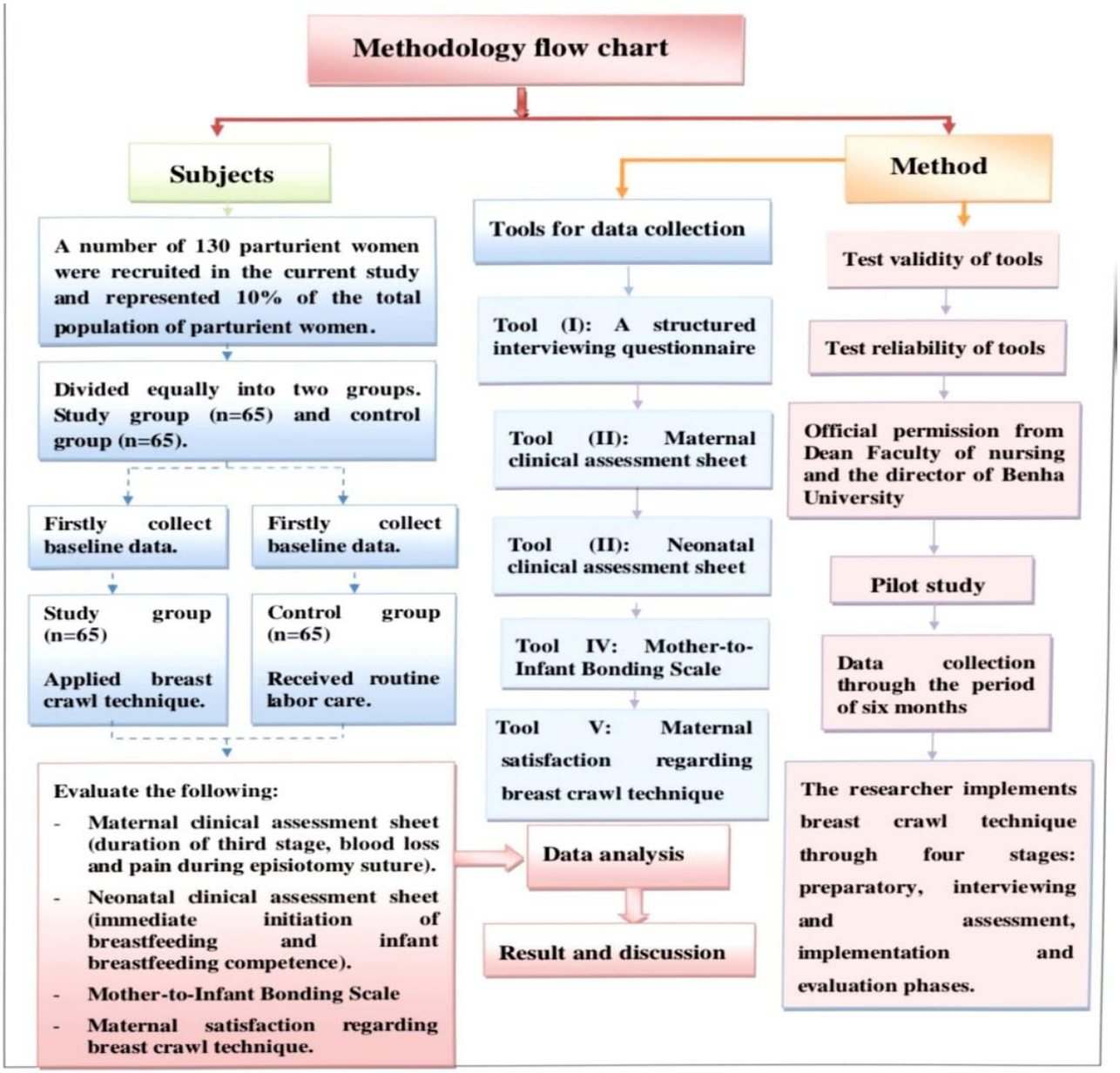
Evaluation phase:

For both groups, during third stage of labor the researchers used **tool II** to assess duration of the stage, amount of blood loss and woman's perception for pain intensity

during episiotomy repair by using during third stage of labor. **Tool III (part I)** to assess early initiation of breastfeeding immediately after delivery. **Tool III (part II)** to assess infant breastfeeding competence after one hour of applying breast crawl technique. **Tool IV** to assess mother –to-infant bonding scale. **Tool V** to assess maternal satisfaction regarding breast crawl technique before hospital discharge.

Statistical analysis:

Data tabulation and analysis were done using SPSS version 25 (Statistical Package for Social Sciences). The use of descriptive statistics was used (e.g., mean, standard deviations, frequencies, and percentages), independent t-test, Chi-square (X2) test, Fisher Exact Test and Pearson correlation coefficients (r) tests were applied. For all of the statistical tests done, p-value > 0.05 which indicated no statistically significant difference, p-value ≤ 0.05 indicated a statistically significant difference and p-value ≤ 0.001 indicated a highly statistically significant difference.



Results:

Table [1]: Shows general characteristics and obstetric history of the studied sample. It was cleared that that 44.6% and 46.2% of study and control groups were in age group 18- < 23 years old with a mean age of 22.04 ± 2.83 and 22.06 ± 2.94 years respectively. Moreover, 78.5% and 69.2% of study and control groups were lived in rural area respectively. Concerning educational level, 78.5% in the study group and 64.6% in the control group had secondary education respectively. As regards occupation, 58.5% and 50.8% were working in the study group and control groups respectively. There was no statistically significant difference between both groups regarding general characteristics ($p > 0.05$). Regarding gestational age, 56.9% and 52.3% of study and control groups were in the gestational age of 37-39 weeks with the mean of 38.29 ± 1.49 and 38.43 ± 1.51weeks respectively.

Table (2): Clears that the mean duration of third stage of labor was 15.03 ± 7.16 minutes for the study group compared to 21.45 ± 8.23 minutes for the control group. Also, the mean blood loss during third stage of labor was 255.23 ± 21.80 ml for the study group compared to 320 ± 38.87 ml for the control group. Additionally, the mean pain score of episiotomy suturing in study group was less than control group 4.35 ± 1.20 versus 6.97 ± 1.65 respectively with a statistical significant difference between both groups regarding maternal outcomes ($p \leq 0.001$, $p \leq 0.05$).

Table [3]: Clears that after applying breast crawl technique, the mean score of immediate initiation of breastfeeding was higher in study group compared to the control group 8.26 ± 1.54 versus 5.89 ± 2.34 respectively. Also, after applying breast crawl technique, the mean score of infant breastfeeding competence was higher in study group compared to the control group 9.79 ±2.60 versus 5.19 ± 2.89 respectively with a statistical significant difference between both groups regarding neonatal outcomes ($p \leq 0.05$).

Figure (1): Clears that after applying breast crawl technique, 78.5% of study group compared to 40.0% of control group had strong bonding.

Figure (2): Reveals that after applying breast crawl technique, 81.5% of women in study group had high satisfaction regarding breast crawl technique.

Table [4]: Reveals that there was a highly statistical significant positive correlation between total score of mother-to-infant bonding, immediate initiation of breastfeeding and infant breastfeeding competence in the study and control groups ($p \leq 0.001$).

Table [5]: Shows that there was a highly statistical significant positive correlation between duration of third stage of labor and amount of blood loss during third stage of labor in study and control groups ($p \leq 0.001$).

Table [6]: Displays that there was a highly statistical significant positive correlation between total score of maternal satisfaction, immediate initiation of breastfeeding, infant breastfeeding competence and mother-to-infant bonding after applying breast crawl technique in women of study group.

Table (1): Distribution of the studied sample in both groups according to general characteristics and obstetric history (n= 130)

General characteristics	Study group n= 65		Control group n=65		X^2/FET	p-value
	No.	%	No.	%		
Age (years)						
18- < 23 23- < 28 28- <33	29 27 9	44.6 41.5 13.9	30 24 11	46.2 36.9 16.9	0.766	0.682 ns
Mean ± SD	22.04 ± 2.83		22.06 ± 2.94		t=0.030	0.976 ns
Residence						
Rural Urban	51 14	78.5 21.5	45 20	69.2 30.8	1.99	0.185 ns
Educational level						
Primary education Secondary education University education	1 51 13	1.5 78.5 20.0	0 42 23	0.0 64.6 35.4	4.64£	0.098 ns
Occupation						
Working House wife	38 27	58.5 41.5	33 32	50.8 49.2	1.11	0.291 ns
Gestational age (Weeks)						
37-39 40-42	37 28	56.9 43.1	34 31	52.3 47.7	0.279	0.597 ns
Mean ± SD	38.29 ± 1.49		38.43 ± 1.51		t=0.525	0.601 ns

X^2=Chi-square test € FET= Fisher Exact Test ns no statistical significant difference (p > 0.05) t= independent t test

Table (2): Comparison of mean scores of maternal outcomes after applying breast crawl technique between study and control groups (n=130).

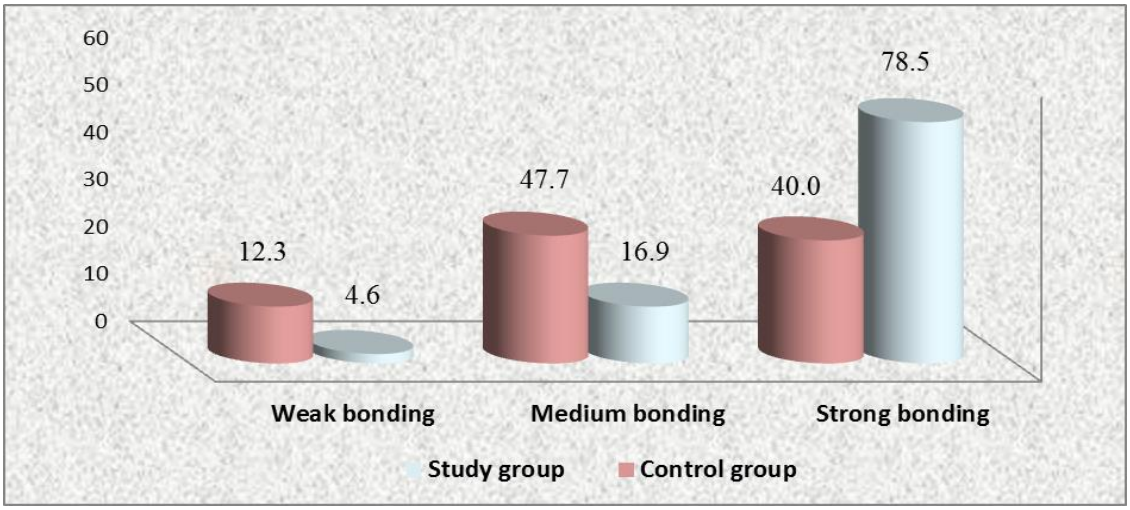
Maternal outcomes variables	Study group n= 65	Control group n=65	Independent t test	p-value
	Mean ± SD	Mean ± SD		
Duration of third stage of labor (minutes)	15.03 ± 7.16	21.45 ± 8.23	3.15	0.001**
Amount of blood loss during third stage of labor (ml)	255.23 ± 21.80	320 ± 38.87	9.66	0.00٥*
Pain intensity of episiotomy suturing	4.35 ± 1.20	6.97 ± 1.65	10.13	0.002 *

*** Statistical significant difference (p ≤ 0.05) ** Highly statistical significant difference (p ≤ 0.001)**

Table (3): Comparison of mean scores of neonatal outcomes after applying breast crawl technique between study and control groups (n=130).

Neonatal outcomes variables	Maximum score	Study group n= 65	Control group n=65	Independent t test	P-value
		Mean ± SD	Mean ± SD		
Immediate initiation of breastfeeding	10	8.26 ± 1.54	5.89 ± 2.34	4.78	0.002*
Infant breastfeeding competence	12	9.79 ± 2.60	5.19 ± 2.89	10.23	0.003*

*** Statistical significant difference (p ≤ 0.05)**



X2= 10.40 p= 0.001**

Figure (1): Percentage distribution of studied women in both groups regarding level of total score of mother-to-infant bonding after applying breast crawl technique (n=130).

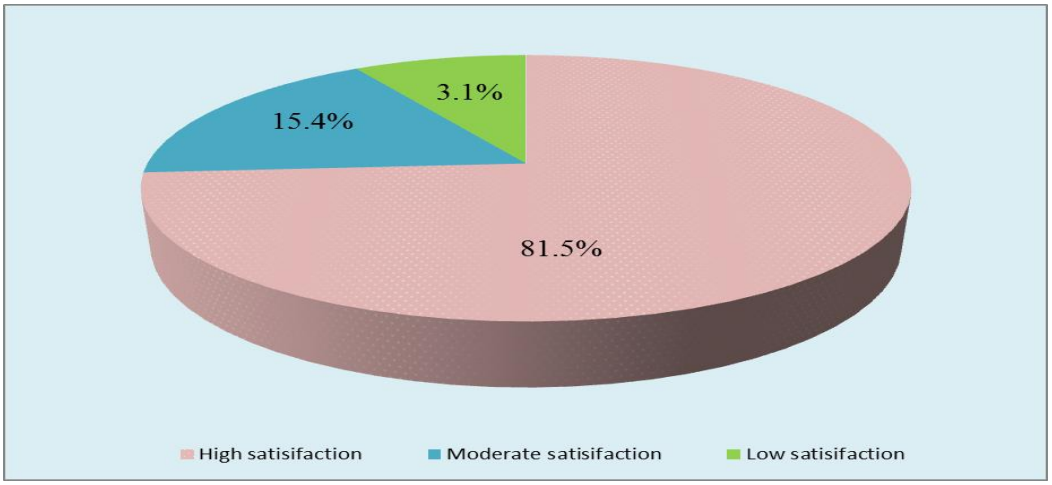


Figure (2): Percentage distribution of women in study group according to level of total satisfaction regarding breast crawl technique (n=65).

Table (4): Correlation coefficient between total score of mother-to-infant bonding, immediate initiation of breastfeeding and infant breastfeeding competence after applying breast crawl technique in study and control groups (n=130).

Variables	Total score of mother-to-infant bonding			
	Study group n=65		Control group n=65	
	r	P-value	r	P-value
Immediate initiation of breastfeeding	0. 868	0.000**	0.772	0.000**
Infant breastfeeding competence	0.791	0.000**	0.611	0.0٠0**

** Correlation is significant at the 0.01 level.

Table (5): Correlation coefficient between duration of third stage and amount of blood loss during third stage of labor after applying breast crawl technique in study and control groups (n=130).

Variable	Duration of third stage of labor			
	Study group n=65		Control group n=65	
	r	P-value	r	P-value
Amount of blood loss during third stage of labor	0.917	0.000**	0.727	0.000**

** Correlation is significant at the 0.01 level.

Table (6): Correlation coefficient between total score of maternal satisfaction, immediate initiation of breastfeeding, infant breastfeeding competence and mother-to-infant bonding after applying breast crawl technique in women of the study group (n=65).

Variables	Total satisfaction score	
	r	P-value
Immediate initiation of breastfeeding	0. 824	0.000**
Infant breastfeeding competence	0. 746	0.000**
Mother-to-infant bonding	0. 813	0.000**

** Correlation is significant at the 0.01 level.

Discussion

Breast crawl technique is an evidence based practice provides several benefits for both the mother and newborn in reducing placental expulsion time, decreasing blood loss, lowering episiotomy pain during suture, assisting in early involution of uterus, helping maintain newborn body temperature, promoting immediate initiation of breastfeeding and strengthening bonding between mother and newborn **(Mohan and Philip, 2024).**

The current study aimed to investigate the effect of breast crawl technique during third stage of labor on maternal and neonatal outcomes.

Concerning general characteristics and obstetric history of studied women, the results of current study revealed that less than half of study and control groups were in age group 18- < 23 years old with a mean age of 22.04 ± 2.83 and 22.06 ± 2.94 years respectively. Moreover, more than three-quarters of study group and more than two-thirds of control groups lived in rural area. Concerning educational level, approximately more than three-quarters of study group and less than two-thirds of control group had secondary education. As regards occupation, more than half of study and control groups were working. Regarding gestational age, more than half of study and control groups were in the gestational age of 37-39 weeks with the mean of 38.29 ± 1.49 and 38.43 ± 1.51weeks respectively with no statistical significant difference between study and control groups.

The results of the current study agreed with **Sarma and Ridhwaanah, (2022)** studied "A Study to Assess the Effectiveness of Breast Crawl Technique on Initiation of Breastfeeding among Newborns at Selected Hospitals of Kamrup District" mentioned that the majority (66.7%) of experimental group and (60%) of control group were in age group 18- 24 years and majority (60%) and (46.7%) of experimental group and control groups had secondary education respectively.

Also, these results were in congruent with **Jyotsana, (2024)** studied "A Study to Assess the Effectiveness of Breast Crawl Technique on Episiotomy Suturing Pain among Primi Mothers at Tertiary Care Hospital at Bangalore" clarified that (38%) of experimental group and (46%) of control group were in age group 21-25 years and (52%) and (44%) of experimental and control groups had secondary education. Also, majority of both experimental group (56%) and control group (86%) were belonged to rural area with no statistically significant difference between study and control groups regarding (age, educational status and occupation).

The results of current study were in the same line with **Nair et al., (2023)** studied "Factors Influencing Success of Breast Crawl in Terms of Positive Maternal and Fetal Outcome among Primi Parturient Mothers Admitted in Labor Room at Tertiary Care Centre" showed that there was no statistical significant difference regarding completed weeks of gestation where (5%) of mothers completed 38 weeks, (38%) of mothers completed 39 weeks and (58%) of mothers completed 40 weeks of gestation.

On the other hand, the current study results disagreed with **Hewedy et al, (2023)** studied "Effect of Immediate Mother and Newborn Skin –to - Skin Contact on Maternal and Neonatal Health " reported that more than three-quarters of studied women in both study and control groups were housewife 78% and 81% respectively and largest proportion of women in both study and control groups 81%

and 79% respectively were lived in urban area.

Regarding maternal outcomes of studied women, the results of current study indicated that the mean duration of third stage of labor in study group was shorter than control group 15.03 ± 7.16 minutes compared to 21.45 ± 8.23 minutes with a highly statistical significant difference between both groups. Also, the mean blood loss during third stage of labor in study group was lower than control group 255.23 ± 21.80 ml compared to 320 ± 38.87 with a statistical significant difference between both groups. Moreover, the result of current study revealed that the mean pain of episiotomy suturing in study group was less than control group 4.35 ± 1.20 versus 6.97 ± 1.65 with a statistical significant difference between both groups. These results were supported the research hypotheses I and II which stated that parturient women who will apply breast crawl technique will have shorter duration of third stage of labor and lower blood loss and pain during episiotomy repair than those who don't apply it.

From the researchers' point of view, the breast crawl technique has a significant effect on maternal outcomes during third stage of labor as it enhances uterine contractions resulting in faster expulsion of placenta, therefore, shortening the duration of the third stage of labor. As well as, newborn's hands during crawling increases release of oxytocin causing reduction of blood loss. Moreover, breast crawl technique is effective in reducing the intensity of episiotomy pain during suturing as it acts as method of diversion redirecting the mother's attention to the newborn.

The results of current study were in the same line with **Sreesha et al., (2024)** studied "Breast Crawl as a Part of Management of Third Stage of Labor: A Case Control Study" clarified that after applying breast crawling method on cases group, it was found that mean duration of third stage of labor significantly reduced in case group 10.28±1.05 minutes as compared to that for control group 12.34± 1.61 minutes. Also, after comparing effect of breast crawling method on amount of blood loss, it was found that mean amount of blood loss was significantly less in case group 221.80±77.45 ml as compared to that for control group 281.60±77.25ml. Additionally, majority 43(86%) of case group had only moderate pain and only 7(14%) had severe pain compared to 37(74%) of control group had moderate pain and 13(26%) had severe pain.

Also, These results were in agreement with **Nair and Salunkhe, (2022)** studied "Effect of Breast Crawl on Length of The Third Stage of Labor and Blood Loss" revealed that the mean duration of the third stage of labor in successful breast crawl group was 16.29± 1.32 minutes compared to 18.63 ± 3.12 minutes in unsuccessful breast crawl group and amount of blood loss was 251.78 ± 53.61 ml for successful breast crawl group compared to 334.50 12± 120.26 ml for unsuccessful breast crawl group with a highly statistical significant difference between both groups.

Additionally, the results of current study agreed with **Hublikar and Bhore (2021**) studied "Effect of Breast Crawl on Maternal Outcome in Third Stage of Labor" clarified that mean blood loss during third stage of labor in experimental group was 132.3 ± 18 ml compared to 154.3 ± 16.20 ml with a highly statistical significant difference between both groups.

Moreover, the results of current study were similar to **Mohana et al., (2022)** studied "Effectiveness of Breast Crawl Technique on Intensity of Episiotomy Suturing Pain Among Primi Mothers at Karpaga Vinayaga Institute of Medical Sciences and Research Centre in

Chengalpattu District" found that majority (83.3%) of experimental group had mild pain during suture of episiotomy compared to majority (73.3%) of control group had severe pain during suture of episiotomy with a highly statistical significant difference between both groups.

As regards neonatal outcomes after applying breast crawl technique, the results of current study showed that the mean score of immediate initiation of breastfeeding and infant breastfeeding competence were higher in study group compared to the control group with a statistical significant difference between both groups. These results were supported the research hypotheses III which stated that parturient women who will apply breast crawl technique will have immediate initiation of breastfeeding and enhanced infant breastfeeding competence than those who don't.

From the perspective of the researchers, breast crawl technique is a valuable approach for promoting early breastfeeding initiation immediately after birth and helping newborns develop proper breastfeeding skills which result in improving breastfeeding competence and increasing successful exclusive breastfeeding as breast crawl technique allows the newborn to instinctively latch onto the breast and begin breastfeeding.

These results were in accordance with **Dhanawade et al., (2024)** studied "The Impact of Breast Crawl on the Effectiveness of Breastfeeding in the First 48 Hours: A Quasi-experimental Study" reported that the score of modified LATCH scale and infant breastfeeding competence was higher in breast crawl group than standard care group with a highly statistically significant difference between both groups.

Moreover, the results of current study were in agreement with **PM and Varghese, (2022)** studied "Effectiveness of Breast Crawl on Initiation of Breastfeeding among Newborn and Mother's Self Satisfaction in a Tertiary Care Hospital" mentioned that the experimental group had a significantly higher LATCH breastfeeding score 8.87 ± 0.681 than the control group 6.50 ± 0.861.

Also, these results were in harmony with **Shan, (2021)** studied "Effectiveness of Breast crawl in initiation and maintenance of effective breastfeeding among newborns in selected hospital at Kollam" showed that mean score of initiation of breastfeeding in experimental group was 16.133 ± 0.83 and in control group was 12.433 ± 1.14 with a statistically significant difference between both groups.

Concerning mother-to-infant bonding of studied women, the results of current study clarified that after applying breast crawl technique, more than three-quarters of study group compared to less than half of control group had strong bonding, less than one-quarter of study group and less than half of control group had medium bonding and minority of study group compared to less than one-quarter of control group had weak bonding with a highly statistical significant difference between both groups. These results were supported the research hypotheses IV which stated that who will apply breast crawl will have stronger postpartum bonding than those who don't.

From the researchers' perspective, the breast crawl technique significantly enhances bonding between mothers and newborns due to the natural, instinctive behaviors of the newborn and the close, uninterrupted contact between them and early connection helps strengthen the emotional bonding between the mother and newborn, creating a basis for a positive and nurturing relationship.

These results were in accordance with **Ahmed et al, (2023)** studied "Effect of Breast Crawl on the Outcomes of Third Stage of Labor, Initiation of Breastfeeding, and Bonding among Primiparae" showed that

majority (90%) of study group had strong bonding compared to minority of control group with a highly statistically significant difference between both groups.

Additionally, this result is supported by **Rana and Swain, (2022)** studied "Understanding the Effective Breast Crawl on Maternal and Newborn Benefits and its Feasibility: A literature Review" mentioned that breast crawl technique enhances bonding between the mother and newborn and promotes maternal-newborn attachment.

As well as, the results of current study were similar to **El-ayari et al., (2023)** studied "The impact of Kangaroo Care on Psychological Bonding, Placental Separation, and Maternal Anxiety among primiparas women, Kafrelsheikh" mentioned that majority (88%) of the study group and less than three quarters (72%) of the control group had good bonding with their infants.

Concerning maternal satisfaction regarding breast crawl technique, the findings of the current study clarified that more than three-quarters of women in study group had high satisfaction and less than one-quarter of them had moderate satisfaction while, minority of them had low satisfaction. This is may be due to the breast crawl technique helped the women feel more comfortable and confident during the procedure and fostered a close bonding between the healthcare provider and the mothers. This connection, along with the benefits of the breast crawl technique enhanced sense of reassurance leading to overall satisfaction.

These results were consistent with **Nair, (2022)** studied "Breast crawl-maternal satisfaction" revealed that (100%) of mothers were fully satisfied after applying the breast crawl technique.

Also, the results of current study were similar to **Rana and Swain, (2023)** studied "Efficacy of the Standard Breast Crawl Technique on Maternal and Newborn Outcomes after Term Vaginal Birth: A Randomized Controlled Trial" stated that more than two thirds (78.33%) of mothers were very satisfied after applying the breast crawl technique.

Regarding correlation coefficient between total score of mother-to-infant bonding, immediate initiation of breastfeeding and infant breastfeeding competence, the findings of the current study clarified that there was a highly statistical significant positive correlation between total score of mother-to-infant bonding, immediate initiation of breastfeeding and infant breastfeeding competence in study and control groups. In the researchers' opinion: immediate initiation of breastfeeding establishes a stronger connection of newborn with the mother's breast leading to better milk intake and longer-term breastfeeding success.

Regarding correlation coefficient between duration of third stage of labor and amount of blood loss during third stage of labor, the findings of the current study clarified that there was a highly statistical significant positive correlation between duration of third stage of labor and amount of blood loss during third stage of labor in study and control groups. The shorter duration of third stage of labor, the less blood loss during third stage of labor.

The result of current study was in agreement with **Chikkamath et al., (2021)** studied "Duration of third stage labor and postpartum blood loss: a secondary analysis of the WHO champion trial data" showed that there was a positive association between third stage of labor duration and amount of blood loss during third stage, the predicted value for blood loss increased steeply with duration of at least 10 minutes (in which almost 90% of women are included) and more slowly after 10 minutes.

Also, This result was in consistent with **Mohammed, (2024)** studied "Breastfeeding Influence on Vaginal Bleeding in Late Labor: A Comparative Study" mentioned that there was a highly statistical significant positive association between duration of third stage of labor and amount of blood loss during third stage of labor ($P < 0.001$) and showed that greater time in the third stage of labor caused more bleeding.

Regarding correlation coefficient between total score of maternal satisfaction, immediate initiation of breastfeeding, infant breastfeeding competence and mother-to-infant bonding, the findings of the current study clarified that there was a highly statistical significant positive correlation between total score of maternal satisfaction, immediate initiation of breastfeeding, infant breastfeeding competence and mother-to-infant bonding after applying breast crawl technique in women of study group.

These results are supported by **Mclnnes and Donnellan-Fernandez, (2023)** studied "Breastfeeding: Women's Experiences in the Transition to Motherhood" mentioned that immediate initiation of breastfeeding enhances the infant breastfeeding competence and facilitates better latching and feeding patterns and also promotes bonding between the mother and newborn which in turn increases overall maternal satisfaction.

Also, this result was similar to **Kumar and Prasad, (2021)** studied "Maternal Satisfaction through Breastfeeding: An empirical study" revealed that there was a statistically significant correlation between maternal satisfaction and mother baby bonding ($p < 0.01$)

Conclusion

Based on the results of the current study, it was concluded that, breast crawl technique had positive effect on maternal outcomes (shorter duration of the third stage of labor, less blood loss and lower episiotomy pain during suture) and neonatal outcomes (immediate initiation of breastfeeding and enhanced infant breastfeeding competence). In addition, breast crawl technique markedly strengthens the bonding between mother and newborn. Moreover, the women in study group exhibited satisfaction regarding application of breast crawl technique. Therefore, the study aim was achieved and the hypotheses were supported.

Recommendations:

- The breast crawl technique is recommended to be integrated with routine labor care to enhance maternal and neonatal outcomes.
- Dissemination of the designed brochure regarding benefits of breast crawl technique at obstetrics and gynecology department for all parturient women.

Recommendations for further studies:

- Conducting awareness program for maternity nurses about the importance of breast crawl technique in reducing complications of third stage of labor.
- A study can be conducted in different settings with larger sample to strengthen and generalize the study findings.
- A comparative study can be conducted on the effect of breast crawl technique during the third stage of labor on maternal outcomes between the caesarean section and normal vaginal delivery mothers.

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تأثير تقنية الزحف الصدري أثناء المرحلة الثالثة من الولادة علي نتائج الأم وحديثي الولادة

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تُعد تقنية الزحف الصدرى طريقةً مميزةً تُقلل من معدلات المراضة والوفيات لدى الأمهات والمواليد الجدد. **هدف الدراسة:** هدفت الدراسة الحالية إلى دراسة تأثير تقنية الزحف الصدرى أثناء المرحلة الثالثة من الولادة على نتائج الأم وحديثي الولادة. **تصميم الدراسة:** تصميم بحث شبه تجريبي. **بيئة الدراسة:** أُجريت هذه الدراسة في وحدة الولادة بقسم أمراض النساء والتوليد التابع لمستشفى جامعة بنها. **عينة الدراسة:** عينة قصدية من ١٣٠ سيدة في مرحلة الولادة، مُقسمة بالتساوي إلى مجموعتين: مجموعة دراسة (٦٥) ومجموعة ضابطة (٦٥). **أدوات جمع البيانات:** استُخدمت خمس أدوات: ١) استبيان المقابلة الشخصية، ٢) استمارة تقييم سريري للأمهات، ٣) استمارة تقييم سريري لحديثي الولادة، ٤) مقياس الترابط بين الأم وحديثي الولادة ، ٥) رضا الأم عن تطبيق تقنية الزحف الصدرى. **النتائج:** كان متوسط مدة المرحلة الثالثة من الولادة أقصر في مجموعة الدراسة (١٥,٠٣ ± ٧,١٦ دقيقة) مقارنةً بالمجموعة الضابطة (٢١,٤٥ ± ٨,٢٣ دقيقة) ($p\leq0.001$)، وانخفض متوسط فقدان الدم بشكل ملحوظ بين مجموعة الدراسة (٢٥٥,٢٣ ± ٢١,٨٠ مل) مقارنةً بـ (٣٢٠ ± ٣٨,٨٧ مل) في المجموعة الضابطة ($p\leq0.05$). كما أشارت النتائج إلى أن متوسط درجات البدء الفوري للرضاعة الطبيعية، وكفاءة الرضاعة الطبيعية لدى حديثى الولادة, والترابط بين الأم وحديثى الولادة كان أعلى بشكل ملحوظ في مجموعة الدراسة مقارنةً بالمجموعة الضابطة ($p\leq0.05$ و$p\leq0.001$)، وأن أكثر من ثلثي السيدات في مجموعة الدراسة أبدين رضا عاليًا عن تقنية الزحف الصدرى. **الاستنتاج:** كان لتقنية الزحف الصدرى تأثير إيجابي في تقصير مدة المرحلة الثالثة من الولادة، وتقليل فقدان الدم، وتخفيف ألم شق العجان أثناء الخياطة، وتعزيز البدء الفوري للرضاعة الطبيعية، وتحسين كفاءة الرضاعة الطبيعية لحديثى الولادة ، وتقوية الرابطة بين الأم وحديثى الولادة. **التوصيات:** يُوصى بدمج تقنية الزحف الصدرى مع رعاية الولادة الروتينية لتحسين نتائج الأم حديثى الولادة.