

Effectiveness of “Health Promotion Interventions” on Selected Perinatal Outcomes among Mothers Admitted for Elective Caesarean in PGIMER, Chandigarh 2018-20

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ABSTRACT

Peripartum and pregnancy are the period of transition which would nearly disturb every aspect of a woman's life. The postoperative course of a mother having a caesarean section is different for each mother. The health promotion interventions protocol makes the mothers more competent and confident in self-care and care of neonates.

Objective: The objective of this study was to assess the effectiveness of ‘Health Promotion Interventions’ on pregnant women undergoing elective caesarean on maternal practices and outcomes during the postpartum period and on baby care practices and outcomes during the postpartum period.

Material and Method: A quasi-experimental design was used and 80 mothers with gestational age ≥ 32 weeks were selected by using purposive sampling technique. Ethical clearance was obtained and informed consent was taken from the mothers. Data was collected in the period of July-August 2019. “Health Promotion Interventions” were implemented at the time of pre-assessment and after 3 days, in interventions, the mothers were educated regarding self-care, newborn care and about contraception by using the scrapbook, a booklet was prepared for this package and with the help of demonstration by using a baby dummy. Follow up was done till discharge, telephonically at 12th and 21st day and at 6th weeks of postpartum. The control group was asked to follow routine care including advices and instructions by health care workers

Results: In both groups placenta previa was the main indications for elective caesarean section. The results revealed that in experimental group majority of the mothers were initiated early breastfeeding (85%), passed first flatus within 24 hours after caesarean section (82.5%), performing postnatal exercises (55%), continued exclusive breastfeeding (100%), having normal bowel pattern (100%) lesser number of mothers were having breast engorgement (22.5%) as compared to control group ($p < 0.05$).

In terms of neonatal outcome, 97.5% of newborns were gaining normal weight at 6th weeks and 100 % of the newborn was having normal bowel and bladder pattern and there was no incidence of re-hospitalization of mother and baby in the experimental group. The difference

between both the groups were found statistically significant ($p < 0.001$). The findings also revealed a significant difference between control and experimental group in relation with selected outcomes.

Conclusion: Hence, it has been concluded 'Health Promotion Interventions' improved knowledge and practices of mothers regarding, postnatal self-care, newborn care and care of the baby upto 6 weeks of the postpartum period. Findings also revealed that 'Health Promotion Interventions' was effective in improving the perinatal outcomes after elective caesarean and reducing the occurrence of postpartum complications.

Keywords: Elective caesarean, postnatal care, newborn care, Health Promotion Interventions.

INTRODUCTION

The perinatal period typically begins after 22 completed weeks (154 days) of pregnancy and lasts until seven days after the birth of the baby.¹ A caesarean section is a surgical procedure involving an incision made through the mother's abdomen and uterus to deliver a baby or to remove a deceased fetus. The procedure can be planned (elective), with the purpose of scheduling the birth date according to the medical and obstetric history of the woman or carried out as an emergency measure.² Mothers should receive specialized care to transition into the postpartum period, and antenatal education should include topics such as antenatal and postnatal care, newborn care, and postnatal exercises.

A population-based cohort study was conducted by Eva Rydahl et.al. (2019) an increasing number of caesarean section with advanced maternal age. All the childbirths between 1998 and 2015 ($N = 1,122,964$) were taken. Maternal age is divided into three categories: (30–34 years); (35–39 years), and (40 years and above). Study results showed there was a positive association between advanced maternal age and caesarean section. The study has been concluded as the number of caesarean section increased with increasing maternal age. The association was stronger in nulliparous women compared to multiparous women.³

Common issues faced by mothers in the postnatal period include incisional pain, which depends on the type of incision made during the procedure. Proper care during this crucial period is vital for the wellbeing

of both mothers and newborns, as neglect can lead to significant health deterioration and even death. Sometimes, mothers may experience complications such as deep vein thrombosis, urinary tract infections, pulmonary embolism, chest infections, urinary retention, constipation, and mental health issues following a caesarean section.⁴ Most maternal deaths occur due to postpartum haemorrhage and infection, accounting for 75% of cases. Excessive blood loss of over 1000 ml (in LSCS) usually occurs within the first 24 hours after delivery is called as immediate postpartum haemorrhage. Late haemorrhage is most common between the 5th and 15th day after delivery, often caused by issues such as sub-involution of uterus, retained placental tissue, and infection. Oxytocin plays a crucial role in aiding uterine contraction and retraction in postpartum, facilitating the separation and expulsion of the placenta.⁵ The World Health Organization's data from 2017 indicates that an estimated 295,000 women died during and after pregnancy and childbirth, with 94% of these deaths occurring in areas with limited resources. The substantial variance in maternal mortality rates between low-income and high-income countries, 462 per 100,000 live births compared to 11 per 100,000 live births respectively, underscores the inequalities in access to healthcare services worldwide.⁶

During the postpartum period, healthcare providers evaluate factors such as the size, shape, colour, and symmetry of the breasts. Breasts undergo little change except for some secretion of colostrums. Additionally,

some women may encounter prominent breast engorgement, tenderness, and mastitis.⁷

Following the removal of Foley's catheter, women are encouraged to urinate. Constipation is a common issue attributed to diminished intestinal tone and bowel motility. Monitoring for bowel sounds and distension, as well as inquiring about expelling gas, is essential. Typically, the first bowel movement after a cesarean section, occurring 2-4 days post-surgery, is usually assisted by stool softeners.⁸

After delivery, vital signs should be monitored every 15 minutes for the first hour and then hourly for 4 hours. A temperature of 100.4°F within the initial 24 hours may be due to dehydration or the onset of lactation within 2-4 days. Persistent fever exceeding this level in the first 24 hours may indicate infection. Normal physiological changes like bradycardia (40-70 beats/min) occur for 6-10 days postpartum, while rates above 100 may indicate infection. Hypotension and a rapid, thready pulse may imply bleeding or shock.⁵ Increased body temperature can signal infection, and blood pressure must be measured every 6 hours (NICE, 2006). Mothers will experience changes in blood flow and the elimination of excess fluid through urine, sometimes causing feet and ankle edema. They should avoid prolonged standing and be encouraged to ambulate after 6-8 hours post-caesarean section to promote circulation and reduce the risk of thrombophlebitis.⁵

The mnemonic for postnatal assessment of mother is BUBBLE-HE which stands for B-breast assessment, U-uterus for involution, BB-bladder and bowel assessment, L-lochia, H- Homan' sign (deep vein thrombosis), E-emotional status of mother.⁵

The mother is encouraged to be out of bed after 6-8 hours of caesarean section. Early ambulation promotes circulation and reduces the risk of thrombophlebitis. It also improve bladder and bowel functions.⁸ Mothers should emphasizing rest for physical and psychological recovery,

and promoting pelvic floor muscle exercises and deep breathing are important.⁹

After a caesarean, mothers can take sips of water after 8 hours and resume a regular diet once bowel movements and flatus are observed.¹⁰ A well-nourished diet with increased fluid intake is vital for lactating mothers and their children to support lactation and overall health.⁹

After birth, it's crucial to conduct a thorough examination of newborns within the first 24 hours. Essential signs to note include axillary temperature (36.5-37 °C), pulse rate (100-160 beats per minute), heart rate (60-100 beats/min), and blood pressure (45-60/25-40 mmHg). Regular blood pressure checks aren't necessary for neonates, but observations for danger signs like apnea, chest retraction, tachypnea, jaundice, and abdominal distension are vital. It's also important to monitor the neonate's weight, which normally decreases by 5-10% during the first 10 days but returns within 2 weeks.¹¹

Newborn care primarily involves maintaining temperature. Infants are at high risk of hypothermia due to thinner skin, less subcutaneous fat and superficial blood vessels. Educating mothers on wrapping their baby in a dry, clean cloth, and covering the head and feet with cap and socks is essential. Mothers should also be trained to recognize signs of hypothermia.¹⁰

Breastfeeding is considered the best option for infant feeding as it fulfills both nutritional and emotional needs. Correct positioning and good attachment are important for effective breastfeeding. Education on breastfeeding techniques and positions should start during the antenatal period.¹²

Initiating breastfeeding within four hours of a caesarean section or when the mother feels comfortable is recommended, as both emergency and planned c-sections can impact breastfeeding initiation and duration. Rooming-in after both types of deliveries is advised.¹³

Neonates are highly susceptible to infections. Preventive measures include

hand washing before touching the baby, proper cord care, and maintaining hygiene. Mothers should be advised not to apply anything on the umbilical stump and to keep it dry and clean. Monitoring for signs of infection, such as pus discharge and redness around the cord, is important. Daily bathing is not necessary, but wiping the face, neck, and underarms daily is recommended.¹⁴ Additionally, the baby should be immunized according to the National Immunization Schedule.

Mothers should receive education about contraception options and alternatives. They should also be made aware of different types of contraceptives available.¹⁵

According to the NICE Clinical Guidelines, perinatal care should be continued throughout the pregnancy and after childbirth. Pregnancy and birth recovery, early identification and management of physical, psychological, emotional and social needs are some of its goals.¹⁰

Findings revealed that, if unalleviated the stressors of the postpartum period can lead to anxiety, fatigue, and decreased self-care, which can increase the risk of physical and mental illnesses.

Preoperative teaching about elective caesarean, recovery and taking care of the incisional site, breastfeeding, early movement, and recognizing danger signs of self and baby can be done before the procedure begins. Better health outcomes for both mothers and babies can be achieved by providing comprehensive antenatal education to mothers about the postpartum period after caesarean section.

The maternal and perinatal health perinatal can be promoted by offering various health promotion strategies or interventions. These interventions will reduce morbidity, risk of infection, hospital stay, improve health-seeking behaviour, enhance recovery of the mother after a surgical procedure, will improve positive coping skills, self-efficacy in postnatal mothers regarding self-care and care of the newborn. It also improves the health of the newborn.

MATERIAL AND METHODS

A quasi-experimental design was used and 80 mothers with gestational age ≥ 32 weeks were selected by using purposive sampling technique. Ethical clearance was obtained and informed consent was taken from the mothers. Data was collected in the period of July-August 2019. Tools used for data collection were Interview Schedule which included Socio-demographic profile, Obstetrical profile, Profile of newborn, Self-developed questionnaire used to assess the practices and outcomes of the mothers and baby within 24 hours, after 24 hours, at 12th day, at 21st day and 6th weeks and pain rating scale. The investigator was introduced her to the pregnant mothers and gradually moved to the interview by asking questions, data was also taken from hospital records. To avoid contamination of data the pregnant women in control group were enrolled first then followed by experimental group.

Health Promotion Interventions were implemented at the time of pre-assessment and after 3 days, in interventions, the mothers were educated regarding self-care and newborn care and about contraception by using the scrapbook, a booklet was prepared for this package and with the help of demonstration by using a baby dummy. Follow up was done till discharge, telephonically at 12th and 21st day and at 6th weeks of postpartum. The control group was asked to follow routine care including advices and instructions by health care workers.

RESULTS

Table 1 reveals that significantly higher percentage of subjects in the experimental group were initiated early breastfeeding (85%), passed first flatus (82.5%), performing postnatal exercises (55%) and choosing PPIUCD as a temporary method of contraception (7.5%) and tubectomy as a permanent method (7.5%). 82.5% of the subjects were early ambulated in the experimental group and 25% were in the control group ($p < 0.001$).

Whereas in the control group, the lower percentage of subjects were initiated early breastfeeding (30%), passed first flatus (47.5%), no subject was performing postnatal exercises and no one had chosen PPIUCD as a temporary method of

contraception, 7.5% of the subjects chose tubectomy as permanent method. 5% of the subjects were undergone hysterectomy due to abruption placenta.

Table 1: Comparison of postnatal self care practices and maternal outcomes among subjects of Control and Experimental group within 24 hours of caesarean section N=80

Variables	Control Group (n ₁ =40)	Experimental group (n ₂ =40)	χ ² value (df) p value
Superficial wound discharge	1 (2.5)	1 (2.5)	0.75 (1) 1.0
Breastfeeding Initiation			
Within four hour or when mother is feeling comfortable.	12 (30)	34 (85)	24.75 (1) <0.001*
Delayed due to			
1. Pain	8 (20)	1 (2.5)	
2. Mother is not willing	12 (30)	1 (2.5)	29.86 (1) <0.001*
3. Baby is not with the mother	8 (20)	4 (10)	
Early ambulation			
Within 6 -8 hours	10 (25)	33 (82.5)	49.3 (1) <0.001*
Urine output with catheter >30 ml/hour	38 (95)	39 (97.5)	0.34 (1) 0.55
Duration of catheterization			
1. 6-12 hours	30 (75)	33 (82.5)	0.67(1) 0.41
2. 13-18 hours	2(5)	4 (10)	0.21 (1) 0.64
3. 19-24 hours	4 ((10)	1 (2.5)	1.92 (1) 0.16
4. 24 hours	4 (10)	2 (5)	0.72 (1) 0.39
Passed urine after removal of catheter	40 (100)	40 (100)	---
Postpartum contraception			
1. PPIUCD	0 (0)	3 (7.5)	
2. Tubectomy	1 (2.5)	3 (7.5)	4.01 (3)0.04*
Hysterectomy	2 (5)	0 (0)	4.01 (3)0.04*
Passed first flatus	19 (47.5)	33 (82.5)	28.47 (1) 0.01*

*p value significant at <0.05

Table 2: Comparison of postnatal self care practices and maternal outcomes among subjects of Control group and Experimental group on 3rd postpartum day N=80

Variables	Control Group (n ₁ =40)	Experimental group (n ₂ =40)	χ ² /Fisher’s exact Test value (df) p value
Breast feeding related complications			
1. Inverted/flat nipples	9 (22.5)	0 (0)	10.14 (1) <0.001*
2. Breast engorgement	30 (75)	9 (22.5)	22.06(1) 0.01*
3. Mothers were able to deal with the problem	1 (2.5)	9 (22.5)	48.50 (1)0.01*
Bladder			
Normal urine output >30 ml/hour	40 (100)	40 (100)	---
Bowel			
1. Passed of flatus	37 (92.5)	40 (100)	(1) 0.77
2. Motion passed	6 (15)	36 (90)	42.28 (1)0.01*

Lochia normal	40 (100)	40 (100)	--
Fluids intake 2-3 litre/day	24 (60.0)	40 (100)	20.00 (1)0.01*
Presence of back pain	27 (67.5)	6 (15)	22.74 (1)0.01*
Postnatal exercises			
1. Deep breathing	0 (0)	40 (100)	80.0 (1))0.01*
2. Foot and ankle exercises	6 (15)	36 (90)	42.28 (1)0.01*
3. Kegel exercise	0 (0)	39 (97.5)	6.09 (1))0.01*

*p value significant at <0.05

Table 2 depicts that significantly higher percentage of subjects in experimental group were Passed flatus (100%), passed a motion (90%), performing deep breathing exercises (100%), foot and ankle exercises (90%), kegel exercise (97.5%) and taking adequate fluid per day (100%) and significantly lower percentage of subjects were having breast engorgement (22.5%), presence of back pain (15%). Whereas in the control group the subjects were passed flatus (92.5%), passed a motion (15%), no one was performing postnatal exercises, taking adequate fluid per day (60%) and a significantly higher percentage of subjects were having breast engorgement (75%) and presence of back pain (67.5%). Findings have been shown that a significantly high number of subjects in the experimental group follow better practices and had better outcomes than in the control group.

Table 3 shows that significantly higher percentage of subjects in experimental group breastfeed independently (90%), had normal bowel pattern (75%), performed postnatal exercises (deep breathing exercises (85%), foot and ankle exercises (85%), kegel exercises(72.5%)), taken healthy diet (100%), taken adequate water

intake 2-3 litter per day (84.6) and significantly lower percentage of subjects were having breast engorgement (20%) as compared to the control in which subjects were having breast engorgement (80%), signs of incisional site infection (37.5%), normal bowel pattern (12.5%), taking healthy diet (85%), taking adequate intake of water (80%), no subject in the control group were performed postnatal exercises. Lochia was normal in both the groups.

on 6th postoperative day, significantly higher percentage of subjects in experimental group breastfeed independently (90%), having normal bowel pattern (80%), performing postnatal exercises (deep breathing (80%), foot and ankle exercises (85%), kegel exercises(80%)), taken healthy diet (100%), taken adequate water intake 2-3 litter per day (84.6) and significantly lower percentage of subjects were had breast engorgement(10%) as compared to the control in which subjects were had breast engorgement (80%), signs of incisional site infection (12.5%), normal bowel pattern (22.5%), taking healthy diet (85%), taking adequate intake of water (80%), no subject in the control group was performed postnatal exercises. Lochia was normal in both the groups.

Table 3: Comparison of postnatal self care practices and maternal outcomes among subjects between Control group and Experimental group on 4th and 6th postpartum day N=80

Variables	Day 4		χ^2 Test value (df) p value	Day 6		χ^2 Test value (df) p value
	Control group (n ₁ =40) f (%)	Experimental group (n ₂ =40) f (%)		Control group (n ₁ =40) f (%)	Experimental group (n ₂ =40) f (%)	
Breastfeed independently	22 (55)	36(90)	0.12(1) 0.72	35(87.5)	36 (90)	0.12 (1) 0.72
Breast Engorgement	32 (80)	8 (20)	28.8(1) <0.001*	32 (80)	4 (10)	23.22(1) <0.001*
Mother is able to deal with the problem	0 (0)	8(20)	54.4(2) <0.001*	4 (10)	4 (10)	39.59(1) <0.001*
Lochia normal	40 (100)	40 (100)	--	40 (100)	40 (100)	--
Sign of infection on incisional site	15 (37.5)	0 (0)	18.46(1) <0.001*	5 (12.5)	0 (0)	5.3(1) 0.02
Bladder pattern normal	40 (100)	40 (100)	--	40 (100)	40 (100)	--
Bowel pattern normal	5 (12.5)	30(75)	31.74(1)0.01*	9 (22.5)	32 (80)	26.46(1) <0.001*
Performing postnatal exercises						
1. Deep breathing	0 (0)	34 (85)	59.13(1) <0.001*	0 (0)	32 (80)	53.3(1) <0.001*
2. Foot and ankle exercise	0 (0)	34 (85)	59.13(1) <0.001*	0 (0)	34(85)	59.13(1) <0.001*
3. Kegel exercise	0 (0)	29 (72.5)	45.49(1) <0.01*	0 (0)	32 (80)	53.3(1) <0.001*
Healthy diet including high fibers	34 (85)	40(100)	6.48(1)0.01*	34(85)	40 (100)	6.48(1)0.01*
3-4 litre water per day	32 (80)	33 (84.6)	0.73(1)0.39	32 (80)	33 (84.6)	0.73(1)0.39

*p value significant at <0.05

Table 4: Comparison of incisional pain level after elective caesarean between Control group and Experimental group after providing Interventions N=80

Variables	Control group (n ₁ =40) f (%) Median (IQR)	Experimental group (n ₂ =40) f (%) Median (IQR)	χ^2 value (df) p value U – Value, p value
On 0 post operative day			
1. Moderate	10 (25)	16(40)	2.05
2. Severe	30 (75)	24(60)	(1) 0.15
	3(2-3) ^U	3(2-3) ^U	680, 0.15 ^U
On 1st post operative day			
1. Mild	4 (10)	28 (70)	30.60
2. Moderate	26 (65)	7 (17.5))	(2) <0.001*
3. Severe	10 (25)	5 (12.5)	350, <0.001 ^U
	2 (1-3) ^U	1 (1-3) ^U	
On 2nd post operative day			
1. Mild	15 (37.5)	39 (97.5)	32.82
2. Moderate	25(62.5)	1 (2.5)	(1) <0.001*
	2 (1-2) ^U	1 (1-2) ^U	320, <0.01 ^U

* p value significant at <0.05, ^U
Mann Whitney test

Table 4 reveals that 65% of the mother in the control group and 17.5% subjects in the experimental group were having moderate pain on 1st postoperative day. On the 2nd postoperative days 97.5% of mothers in experimental and 37.5% in the control group were having mild pain. Pain is significantly lower on the 1st and 2nd postoperative day in subjects of the experimental group as compared to the control group (p<0.001). This revealed that ‘Health Promotion Interventions’ is effective in reducing the level of pain among subjects after caesarean section.

Comparison of postnatal self-care practices and maternal outcomes among subjects as shown in Table 5 at follow up day 12th, In the experimental group significantly higher percentage of subjects were continued exclusive breastfeeding (100%), having normal bowel pattern(85%), performed postnatal exercises(75%), taking adequate fluid (97.5%), no mother was having sign of incisional site infection and no mother was having incidence of hospital re-visit as

compared to the control group where lower percentage of subjects continued exclusive breastfeed (85%), normal bowel pattern (45%), performed postnatal exercises (20%), taking adequate fluid (75%), 12.5% of subjects was having incidence of re-visit the hospital and 15% of subjects were having sign of incisional site infection.

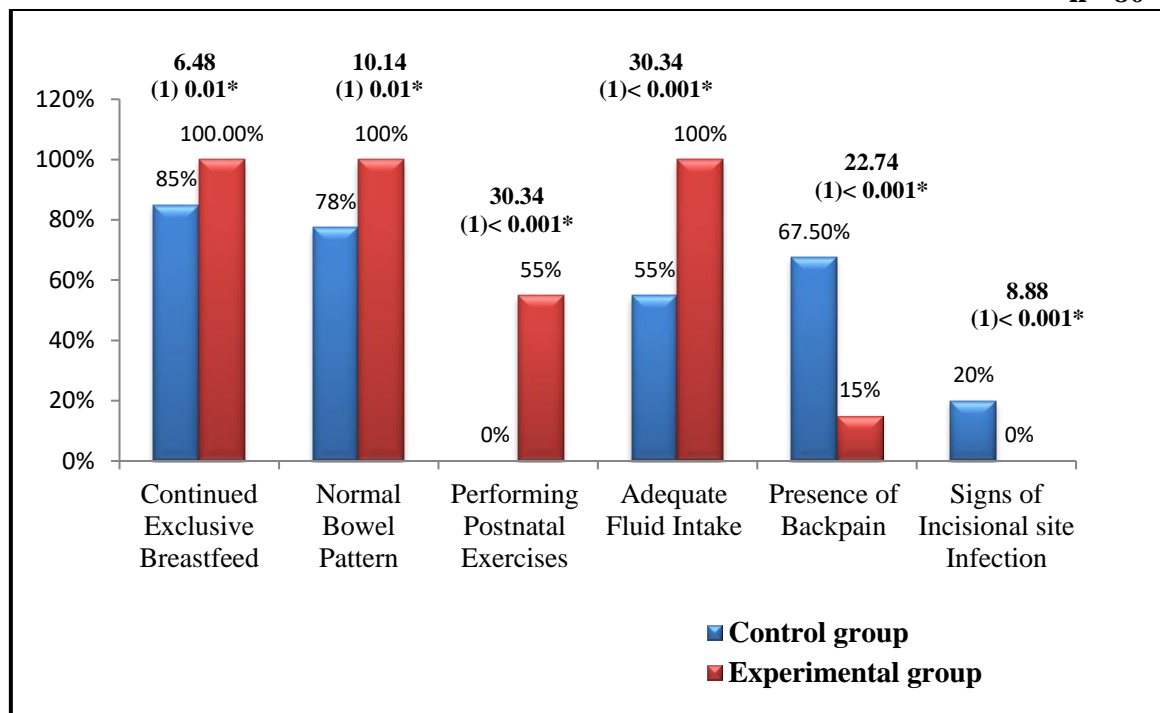
And at follow up day 12th, In the experimental group significantly higher percentage of subjects were continued exclusive breastfeeding (100%), having normal bowel pattern(92.5%), performed postnatal exercises(67.5%), taking adequate fluid (85%) no subject was having an incidence of hospital re-visit and only 2.5% of subjects was having sign of incisional site infection as compared to the control group where lower percentage of subjects continued exclusive breastfeed(85%), normal bowel pattern (40%), no mother was performing postnatal exercises, taking adequate fluid (42.5%), 15% of subjects were having incidence of re-visit the hospital and 17.5% of subjects were having sign of incisional site infection.

Table 5: Comparison of postnatal self care practices and maternal outcomes among subjects between Control group and Experimental group on telephonically follow up at 12th and 21st day N=80

Variables	Day 12		χ^2 Test value (df) p value	Day 21		χ^2 value (df) p value
	Control group (n ₁ =40) f (%)	Experimental group (n ₂ =40) f (%)		Control group (n ₁ =40) f (%)	Experimental group (n ₂ =40) f (%)	
Breastfeed Continued	34 (85)	40 (100)	6.48 (1)0.01*	34 (85)	40 (100)	6.48 (1)0.01*
Sign of infection on incisional site	6 (15)	0 (0)	6.48 (1) 0.01*	7 (17.5)	1 (2.5)	5 (1) 0.02*
Normal bowel pattern of mother	18 (45)	34(85)	14.06 (1) <0.001*	16 (40)	37(92.5)	24.66 (1) 0.01*
Performing postnatal exercises (deep breathing, foot and ankle, kegel exercise, leg raise, pelvic tilt)	7 (20)	30 (75)	26.6 (1) <0.001*	0 (0)	27 (67.5)	40.75 (1) 0.01*
Healthy diet including high fibers	25 (62.5)	33 (82.5)	4.01 (1)0.01*	32 (80)	34 (90)	1.56 (1) 0.02*
3-4 litre water per day	30 (75)	39 (97.5)	8.61 (2) 0.13	17 (42.5)	34 (85)	1.56 (1) 0.01*
Incidence of re-hospitalization or hospital visit of mother	5 (12.5)	0 (0)	5.3 (1) 0.02*	6 (15)	0 (0)	6.48 (1) 0.01*

* P value significant at <0.05

n= 80



* p value significant at <0.05*

Figure 2: Comparison of postnatal self care outcomes and maternal outcomes at 6th weeks between control and experimental group

As shown in Figure 2, significantly higher percentage of subjects in experimental group were continued exclusive breastfeeding (100%), performed postnatal exercises (deep breathing, foot and ankle, kegel exercises, leg raise, pelvic tilt) (55%), having normal bowel pattern (100%), and adequate fluid intake (100%) and lower percent of mother was having back pain (15%).

Whereas in control group significantly lower percentage of subjects were continued exclusive breastfeeding (85%), no mother was performed postnatal exercises (deep breathing, foot and ankle, kegel exercises, leg raise, pelvic tilt), having normal bowel pattern (77.5%), adequate fluid intake (55%) and higher percentage of subjects were having back pain (67.5%).

Table 6: Baseline assessment of Newborn in Control group and Experimental group within 24 hours of birth N=80

Variables	Control group n ₁ = 40 f (%) Mean ± SD	Experimental group n ₂ = 40 f (%) Mean ± SD	χ ² /t value (df) p value
Gender			
1. Male	21 (52.5)	32 (80)	6.765 (1) 0.01*
2. Female	19 (47.5)	8 (20)	
Birth weight (kg)	1.12±0.33	1.05±0.22	-1.18 (78) 0.24
APGAR score			
In 1 minute	2.77±0.42	2.92±0.26	1.9(78) 0.06
After 5 minutes	2.95±0.37	2.97±0.15	0.44 (78) 0.65

*p value significant at <0.05

Baseline assessment of Newborn as shown in Table 6, that the majority of the newborn in the experimental group (80%) were male

than in the control group (52.5%). 80% of the newborn in the experimental group. The mean of the birth weight of the newborn in

the control and experimental group was 1.12±0.33 and kg 1.05±0.22 respectively (p=0.24). Mean of the APGAR score at 1 minute was 2.77±0.42 and 2.92±0.26 and at 5 min was 2.95±0.37 and 2.97±0.15 in the

control and experimental group respectively. Both the groups were comparable in the intense of birth weight and APGAR score.

Table 7: Comparison of post-interventional newborn care practices among subjects of Control and Experimental group on 3rd day of caesarean section N=80

Variables	Control group (n ₁ =40) (f %)	Experimental group (n ₂ =40) (f %)	χ ² /t test value (df) p value
Neonate’s hunger signs	28 (70)	40 (100)	14.11 (2) <0.001*
Maintaining correct position during breastfeeding	23 (57.5)	39 (97.5)	21.58 (2) 0.01*
Latching	21 (52.5)	40 (100)	24.91(2) <0.001*
Position used for breastfeeding			
Cradle	21 (52.5)	39 (97.5)	21.62 (2) <0.001*
Adequacy of feed			
1. Sleeps well	30 (75)	39 (97.5)	8.61 (2) 0.13
2. Passes urine (8-10 times in a day)	39 (97.5)	40 (100)	1.01 (1) 0.31
Immunization (OPV 0, Hepatitis B-0 and BCG)	38 (95)	40 (100)	2.05(1) 0.15
Care of newborn			
1. Maintaining warmth of baby.	38 (95)	40 (100)	2.05 (1) 0.15
2. Umbilical cord care	28 (70)	39 (97.5)	20.00 (2) <0.001*
3. Change wet diaper and wash hands with soap and water.	28 (70)	40 (100)	14.11(2) <0.001*
4. Sponge bath after 24 hours	4 (12.5)	40 (100)	62.22(2) <0.001*
5. Care of eyes	9 (22.5)	40 (100)	50.61(2) <0.001*
6. Skin care or massaging the baby	11 (27.5)	40 (100)	45.49 (2) <0.001*
Warning signs of newborn (16)	14.6±1.46	8.3±0.51	-25.4(78) <0.001

Comparison of post-interventional newborn care practices among subjects as shown in Table 7 that significantly higher percentage of the subjects in the experimental group were able to identify the hunger signs of the neonate (100%), maintained correct position during breastfeeding (97.5%), showed good signs of latching (100%), know about umbilical cord care (97.5%) and 100% of subjects were maintaining the warmth, hand hygiene after changing the diaper of the baby, giving a sponge bath, doing care of the eyes and giving skin massage to the baby.

In control group lower percentage of subjects were able to identify the hunger signs of the neonate (70%), maintained

correct position during breastfeeding (57.5%), showed good signs of latching (52.5%), know about umbilical cord care (70%), maintaining the warmth of the neonate (95%), maintaining hand hygiene after changing the diaper (70%) of the baby, giving a sponge bath (12.5%), doing care of the eyes (22.5%) and giving skin massage to the neonate (27.5%). The mean score of warning signs of the newborn was 14.6±1.46 and 8.3±0.51 in control and experimental group respectively (p<0.01). It has been concluded that baby care outcomes and practices on 3rd postpartum day were better in the experimental group as compared to the control group.

Table 8: Comparison of neonatal outcomes at 4th and 6th day in Control group and Experimental group after caesarean section N=80

Variables	Day 4		χ^2 Test value (df) p value	Day 6		χ^2 Test value (df) p value
	Control group (n ₁ =40) f (%)	Experimental group (n ₂ =40) f (%)		Control group (n ₂ =40) f (%)	Experimental group (n ₂ =40) f (%)	
Newborn handling	23 (57.5)	40(100)	21.58(1) <0.001*	31(77.5)	40 (100)	10.14 (1) <0.001*
Baby is accepting the feed positively	31 (77.5)	38(95)	5.16(1)0.23	37 (92.5)	40 (100)	3.11 (1)0.07
Immunization is complete	38 (95)	40 (100)	2.05 (1)0.15	38 (95)	40 (100)	2.05 (1)0.15
Personal hygiene of the baby	33(82.5)	39 (97.5)	5 (1) 0.02*	33 (82.5)	39 (97.5)	5 (1) 0.02
Bowel and bladder pattern of the baby	40 (100)	40 (100)	--	39 (97.5)	40 (100)	1.01 (1)0.31
Neonatal Jaundice	10 (25)	3 (7.5)	4.5(1) 0.03*	7 (17.5)	2 (5)	3.13 (1) 0.07

Comparison of neonatal outcomes at 4th and 6th day as shown in Table 8 that on 4th day of postpartum majority of subjects in the experimental group were able to handle the neonate (100%) and maintained personal hygiene of the neonate (97.5%). A significantly higher percentage of newborns were accepting feed positively (95%), completed immunization (100%) and a lower percentage of neonates developed jaundice (7.5%). Whereas in the control group, a lower percentage of mothers handled the neonate (57.5%) and maintained personal hygiene of the neonate (82.5%). Significantly lower percentages of newborn were accepting feed positively (77.5%); completed immunization (38% due to low birth weight) and higher percentage of neonates were developed jaundice (25%).

On 6th day the majority of subjects in the experimental group were able to handle the neonate (100%) and maintained personal hygiene of the neonate (97.5%). A significantly higher percentage of newborns were accepting feed positively (100%), completed immunization (100%) and lower percent of neonates were having jaundice (5%). Whereas in the control group, a lower percentage of mothers handled the neonates (77.5%) and maintained personal hygiene of the neonates (82.5%). Significantly lower percentages of newborns were accepting feed positively (92.5%), completed immunization (38%, due to low birth weight) and a higher percentage of neonates were having jaundice (17.5%).

Table 9: Comparison of outcomes related to baby care between Control group and Experimental group on telephonically follow up at 12th and 21st day N=80

Variables	Day 12		χ^2 value (df) p value	Day 21		χ^2 value (df) p value
	Control group (n ₁ =40) f (%)	Experimental group (n ₂ =40) f (%)		Control group (n ₁ =40) f (%)	Experimental group (n ₂ =40) f (%)	
Newborn handling	40 (100)	40 (100)	--	40 (100)	40 (100)	---
Baby is accepting the feed positively	40 (100)	40 (100)	--	40 (100)	40 (100)	---
Applying kajal	18 (45)	0 (0)	23.2 (1) <0.001*	19 (47.5)	0 (0)	24.9 (1) <0.001*
Immunization is complete	40 (100)	40 (100)	--	40 (100)	40 (100)	---
Personal hygiene of the baby	40 (100)	40 (100)	--	40 (100)	40 (100)	---
Baby is healthy and gaining weight 30 gm per day	35 (87.5)	40 (100)	5.3 (1) 0.02	37 (92.5)	40 (100)	3.11 (1) 0.07*
Incidence of re-hospitalization or hospital visit of baby	6 (15)	0 (0)	6.48 (1) 0.01*	8 (20)	0 (0)	8.89 (1) <0.001*

Comparison of outcomes related to baby care as shown in Table 9, during follow up at 12th day majority of babies in the experimental group were healthy and gaining weight 30 gm per day (100%) and there was no incidence of applying kajal and revisiting the hospital. Whereas in control group, a lower percentage of babies were gaining normal weight (87.5%), majority of subjects applying kajal to the baby (45%) and 15% of the babies were having an incidence of re-visit the hospital.

During follow up at 21st day the majority of babies in the experimental group were healthy and gaining weight 30 gm per day (100%) and there was no incidence of applying kajal and revisiting the hospital. Whereas in the control group, a lower percentage of babies were gaining normal weight (92.5%), majority of subjects were applying kajal to the baby (47.5%) and 20% of the babies were having an incidence of re-visit the hospital.

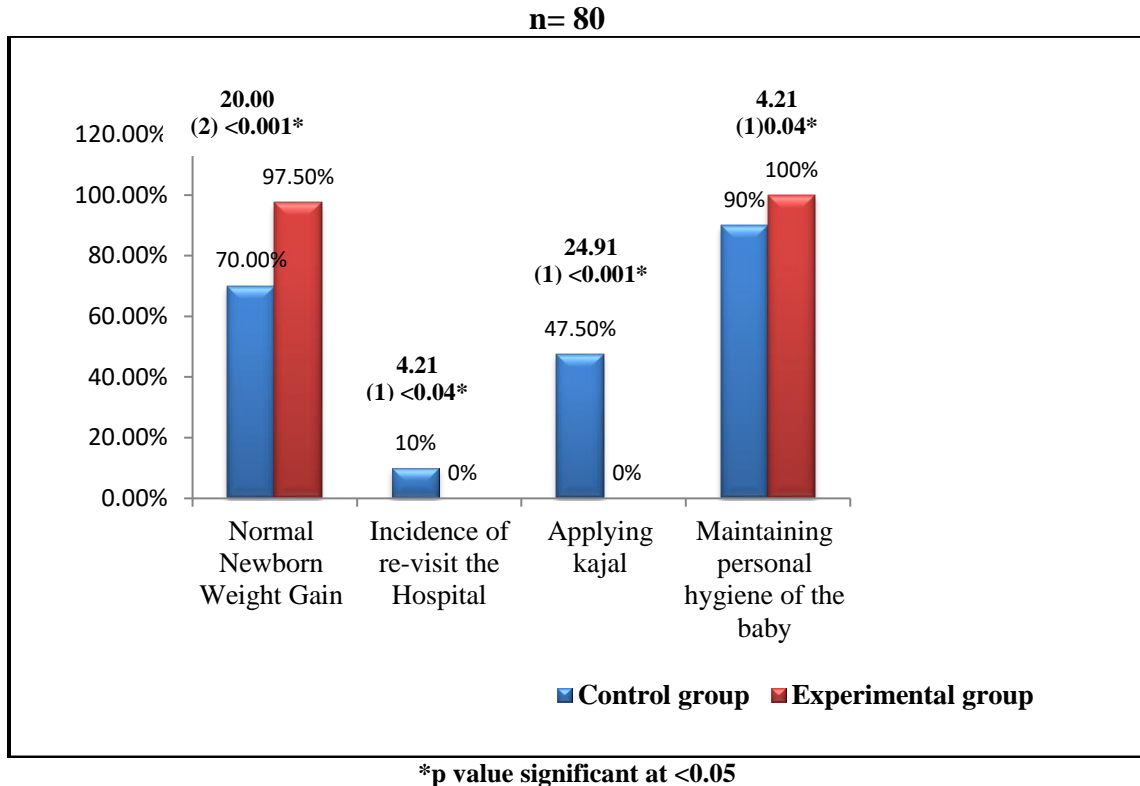


Figure 3: Comparison of Neonatal Outcomes and practices at 6th weeks

Figure 3 showed that a significantly higher percentage of babies in the experimental group (97.5 %) were having normal weight, there is no incidence of hospitalization or hospital visit. Whereas in the control group, (70%) babies were having normal weight, the incidence of hospitalization or hospital visits (10%). It has been concluded that baby care outcomes and practices at 6th weeks were better in the experimental group as compared to the control group.

DISCUSSION

The postpartum period is an essential time in a women’s life after delivery. Nurses and midwives have an essential role in promoting healthy practices among women for a successful postpartum.¹⁶

Evidence suggests that the unresolved stressors of the postpartum period can lead to anxiety, fatigue and decreased self-care which is associated with an increased risk of

physical and mental illness including postpartum depression.

Maternal mental and physical health problems are in turn associated with an increased risk of a multitude of poor health outcomes for the entire household, including early breastfeeding discontinuation, negative maternal perception of her infant.¹ Many studies evidenced that if special care was provided to mothers and babies, it can reduce the complications and also promote the health of mothers as well as babies.¹⁷

Education should be provided during antenatal period to the mothers regarding nutrition, body mechanics, about danger signs so that the mothers are able to identify the danger signs at an early stage, which will improve maternal and neonatal outcomes.

Study results also showed there was significant difference between control and experimental group in relation to maternal outcomes i.e. passed first flatus (82.5% vs. 47.5%, p=0.01), performing postnatal

exercises (55% vs. 0%, $p < 0.001$) and choosing PPIUCD as temporary method of contraception (7.5% vs. 0%, $p = 0.04$) and tubectomy as permanent method (7.5% vs. 2.5% $p = 0.04$). 82.5% of the mother were early ambulated in the experimental group and 25% were the in control group ($p < 0.001$). In the present study, the mothers who get an education in the antenatal period were able to identify the hunger signs (100% vs. 70%, $p < 0.001$) and danger signs in the newborn as compare to the mothers who received routine care. A similar study was conducted by Manisha Kasat et.al (2019) on the effect of quality of antenatal care on the perinatal outcomes. The study concluded that the educational status of the mother and socioeconomic status of the family had significant influence over the regularity of the ANC check-up and perinatal outcomes.¹ Significantly high percentage of mothers in experimental group (82.5%) were early ambulated than in control group (25%), early ambulation also reduce the level of incisional pain in the experimental group and it improve the bowel pattern of the mothers who were early ambulate. Similarly, a study was conducted by Harmanjot Kaur, Sukhjit Kaur et.al (2015), to assess the effectiveness of early ambulation in post-operative recovery among post-caesarean mothers admitted in the selected area of Nehru Hospital, PGIMER, and Chandigarh. The study concluded that early ambulation was effective in postoperative recovery ($p < 0.05$) among post caesarean mothers.¹⁹ Majority of mothers in experimental group were performed postnatal exercises i.e. deep breathing, foot and ankle, kegel exercises, alternate leg raise, pelvic tilt (55%) as compared to the control group in which no mother was performing postnatal exercises. After providing education about the body mechanics and correct posture during pregnancy and after caesarean section, it has been found that in the experimental group

lesser number of mothers developed with back pain.

Incisional pain was managed by analgesics, mind diversion therapies like deep breathing exercises, and by providing comfortable positioning, the results revealed that 65% of the mother in the control group and 17.5% mothers in the experimental group was having moderate pain on 1st postoperative day and 97.5% of mothers on 2nd postoperative day. The pain was significantly lower in the experimental group on 1st and 2nd postoperative day. A similar study done by Karlstrom et.al. Revealed that women's experience high level of postoperative pain after caesarean section during the first 24 hours which suggest that there is a need for adequate pain management for women undergoing caesarean sections high level of pain interference with early infant care and breastfeeding women.²⁰

Education about breastfeeding techniques, correct positioning, latching and exclusive breastfeeding was also given to the mothers i.e. to give only breastfeed to the baby up to 6 months; it helped in the physical and psychological development of the baby. In present study majority of the mother in the experimental group as compared to control group were maintaining correct positioning of breastfeeding and latching (97.5% vs. 57.5%, $p = 0.01$) and continued exclusive breastfeeding at 6 weeks in the experimental group than in control group (100% vs. 85%, $p = 0.01$)

In the experimental group the mothers were having knowledge regarding newborn skin care, newborn handling, eye care, normal weight of the newborn and about the warning signs of the newborn so the mothers were more confident to handle the baby, doing skin massage, doing eye care, changing the diaper, maintaining temperature, recognize hunger signs of the newborn than the mother in the control group.

In the present study lower number of neonates was having neonatal jaundice in the experimental group than in the control group. At 6 weeks 97.5% in experimental group and 70% in control group of the babies were having normal weight i.e. twice of the birth weight Normal weight gain at 6th weeks ($p < 0.001$).

The finding of the present study suggested that mother’s knowledge was increased in the experimental group and there was also a significant improvement in maternal, newborn and baby care practices and outcomes. These health promotion strategies were comprehensive, deliberative because they had included antenatal care, care of mothers and newborn after caesarean section, postnatal exercise, identification of danger signs of mother and baby, alternative methods of contraception and postpartum and baby care up to 6th weeks. These strategies were developed in the form of the booklet so that mothers can use it at home even after discharge.

Hence, it is recommended that health promotion interventions can be used for the promotion of health of the perinatal mothers after elective caesarean section. It is the responsibilities of health care professionals to provide education to the mothers in antenatal period so that they can be knowledgeable, competent, confident and skilful about self-care and newborn care after caesarean section.

CONCLUSION

Health Promotion Interventions improved knowledge and practices of mothers regarding postnatal self-care, newborn care and care of the baby up to 6 weeks of the postpartum period. Health Promotion Interventions was also found to be effective in improving the perinatal outcomes like breastfeeding initiation and continuation, early ambulation, normal bowel pattern, presence of back pain, incisional site pain, signs of incisional site infection, performing postnatal exercises,

newborn care, newborn weight gain. Maternal and neonatal outcomes were better in the experimental group as compared to the control group as the difference was statistically significant. These interventions play an important role in making the mother competent in self-care and newborn care after caesarean section. Hence, it has been concluded that this kind of education should be provided to the mothers in antenatal period for better postpartum outcomes.

Declaration by Authors

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