

Effect of Intermittent Maternal Supportive Care on Pain Intensity and Childbirth Outcomes

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Abstract

Background: Childbirth is an anxiety-producing situation for many women. Intra-partum professional midwifery support can help women cope better with their labor pain and fears as well as raise their childbirth satisfaction. **Aim:** Investigate the effect of intermittent maternal supportive care on pain intensity and childbirth outcomes. **Method:** A quasi-experimental research design was used. A purposive sample of 88 laboring women was enrolled. The current study was carried out at the Labor Unit of Mansoura University Hospital (MUH). Five tools were used for data collection: A Structured Interviewing Schedule, the Visual Analogue Scale (VAS), the Childbirth Attitudes Questionnaire (CAQ), the Neonatal Assessment Sheet, and the Mackey Childbirth Satisfaction Rating Scale. **Results:** Among the intervention group, the severe labor pain and the high childbirth fear levels were significantly reduced post intervention in comparison of the control group. Among the intervention group, three-quarters and the majority of the newborns had normal Apgar scores at the first minute and initiated breastfeeding within the first hour after birth respectively compared to the control group. The childbirth satisfaction level among the intervention group was statistically significantly higher compared to the control group. **Conclusion:** Intermittent maternal supportive care during labor effectively improves outcomes for laboring women and their newborn infants. **Recommendations:** Intermittent maternal supportive care should be implemented routinely in all maternity hospitals to improve childbirth outcomes.

Keywords: Childbirth outcomes, Intermittent maternal supportive care, and Pain intensity.

Introduction

In a woman's life, childbirth is one of the most complex experiences. The mother's emotional distress and mental health are impacted by severe labor pain (Stoll et al., 2018). Along with the delivery process, it also negatively impacts the physiological state of the mother and fetus. Therefore, minimizing labor discomfort is crucial for decreasing the detrimental physiological reactions that result from the woman's pain and anxiety and cause harm to both the mother and the fetus (Hildingsson & Robertson, 2020).

According to Egypt's Vision 2030 and sustainable development strategy, which aims to promote maternal health by ensuring that women have access to high-quality care before, during, and after childbirth from qualified, credentialed health professionals (Metwally et al., 2020). Providing support to women during delivery, which influences both their experiences and the results of their birth, is one of the most crucial factors that can be done to

promote maternal health (Chabbert et al., 2021).

Supporter attendance in the delivery room has evolved into a widespread cultural standard. According to Smith et al., (2018), non-pharmacological pain treatment used by midwives to help women throughout labor constitutes supportive care during labor. The World Health Organization (WHO) advises providing labor support for women throughout childbirth (WHO, 2018). There are no known negative effects of labor support, and both the mother and her newborn infant can experience numerous health advantages (Cicek & Mete, 2021).

According to Demirel et al., (2022), supporting the laboring woman has a significant impact on reducing labor pain, fear, and utilization of analgesics, shortening labor duration, and increasing labor satisfaction. Women who get labor support from nurses are better able to manage their labor and have a better attitude towards the intra-partum care

they receive (Cicek& Mete, 2021). Newborns of laboring women who received support, according to Bohren et al., (2017), may be more likely to have high five-minutes Apgar scores, a decrease in the number of newborns admitted to NICUs for special care, start breastfeeding, increase mother-infant interactions, and not experience any neonatal complications.

The three basic components of labor support are advocacy, physical comfort, and emotional support. First, emotional support is focused on actions like constant presence, encouraging words of affirmation, praise, a caring attitude that works, diversion, spirituality, and relationship care. Second, comfort and physical support measures speed up labor and raise satisfaction with the birthing process (Younes et al., 2020). Offering physical comfort includes giving therapeutic touch, giving massages, taking warm baths or showers, and promoting fluid intake and output. The laboring woman may be able to actively participate in her labor thanks to interventions that promote comfort throughout labor, providing her strength and confidence (Cankaya& Can, 2021).

Last but not least, laboring woman advocacy includes expressing the woman's preferences and providing details on how labor is progressing, coping strategies, or relaxing techniques. The nurse must show respect, recognize the mother's expectations, and settle disputes while speaking up for the laboring woman (Miller et al., 2019). Information, counsel, and partner support are other components of labor support. Instruction for calming down, breathing, and pushing are examples of instructional and informative labor support activities. By giving their partner updates on the woman's labor progress, nurses can help reduce worry and give support (Gailits et al., 2019).

Significance of the study

As declared by Mirghafourvand et al., (2019), providing support to women during labor lowers their requirement for medical interventions, involving medicated deliveries, and enhances maternal and neonatal consequences. Additionally, supportive care from professionals increases women's sense of

control, improves their sense of dignity during childbirth, encourages women to participate in decisions about their care, reduces obstetric interventions during birth, and encourages women to make wise decisions about using maternity health services in the future (Colley et al., 2018).

One of the most crucial duties of nurses is to support women through the childbirth experience. Because nurses frequently cohabit with several laboring women, spend a lot of time in records collection and/or technology management, and start or finish shifts in the middle of women's labors, labor support is not always provided (Bremen&Neerland, 2020). Supportive care from a doula, nurse, or nurse-midwife has proven to enhance delivery outcomes. Consistent use of labor support activities has the potential to improve birthing experiences (Quintero Rodriguez & Troynikov, 2019).

Regardless of the well-known labor support advantages, its practice is yet scarcely used in maternity hospitals, and women's experiences and beliefs may not be taken into account. Consequently, the goal of this study is to investigate the effect of intermittent maternal supportive care on pain intensity and childbirth outcomes.

Aim of the study

The current study aimed to investigate the effect of intermittent maternal supportive care on pain intensity and childbirth outcomes.

Study hypotheses

Hypothesis I: Laboring women who receive the intermittent supportive care exhibit lower level of labor pain than those who receive the routine hospital care.

Hypothesis II: Laboring women who receive the intermittent supportive care exhibit lower level of childbirth fear than those who receive the routine hospital care.

Hypothesis III: Laboring women who receive the intermittent supportive care exhibit a shorter duration of labor stages and a lower rate of oxytocin used in labor than those who receive the routine hospital care.

Hypothesis IV: Newborns of laboring women who receive the intermittent supportive care exhibit normal Apgar scores at the first and fifth minutes, not be admitted to the NICU and initiate breastfeeding within the first hour after birth than whose mothers receive the routine hospital care.

Hypothesis V: Laboring women who receive the intermittent supportive care exhibit higher level of labor satisfaction than those who receive the routine hospital care.

Operational definitions

Intermittent supportive care: In the present study, it encompassed physical comfort measures, emotional support, information and instructions, advocacy, and partner support.

Childbirth outcomes: In the present study, it comprised maternal and neonatal outcomes:

- **Maternal outcomes:** It included labor pain intensity and level of fear of childbirth, duration of labor stages, oxytocin rate used in delivery and labor satisfaction.
- **Neonatal outcomes:** It involved Apgar scores at the first and fifth minutes, NICU admission and breastfeeding initiation within the first hour after birth.

Method

Study design

The research design was quasi-experimental. It is an empirical interventional research that does not utilize randomization in order to define the causal effects of an intervention on the target population. The subjects in this design are splitted into the intervention and control groups and their baseline measurements for the dependent variables are completed. Thereafter, the participants in intervention group only got the suggested intervention. Afterwards, all of participants had a post-test to determine how much the dependent variables had changed (LoBiondo-Wood & Haber, 2018).

Study setting

The current study was carried out at Mansoura University Hospital's (MUH) Labor Unit. It is located on the first floor of the main hospital's building. There are four different rooms on the unit's first floor: the admission,

examination, delivery operation, and post-delivery rooms. It provides emergency obstetric care services three days per week, 24 hours a day. Because it is an educational hospital, this setting was chosen because it allows for the application of interventions with enough staff cooperation and without significant barriers.

Study subjects

Sampling

The sampling included a purposive sample of 88 laboring women who attended the previously mentioned study setting. Laboring women were eligible to take part in the present study if they had the subsequent inclusion criteria: age between 18 and 35 years, ≥ 38 gestation weeks, viable single fetus with occipito anterior position (i.e., normal position), and cervical dilatation of 3-4 centimeter (cm) on admission and accept to participate in the research. Meanwhile, laboring women were excluded from the study if they had epidural anesthesia and had obstetric, psychiatric and medical issues that influence progress of labor.

Sample size

Depended on literature data (Cicek & Mete, 2021). Considering significance level of 5%, and study power of 80%, the following formula can be used to calculate the sample size: $n = [(Z_{\alpha/2} + Z_{\beta})^2 \times \{2(SD)^2\}] / (\text{mean difference})^2$,

Where

SD stands for standard deviation; $Z_{\alpha/2}$ is 1.96 and Z_{β} is 0.84. Therefore, $n = [(1.96 + 0.84)^2 \times \{2(5.84)^2\}] / (3.5)^2 = 43.7$.

Accordingly, the required sample size for the study is 44 women in each group.

Sample recruitment

According to their attendance to the current study setting, subjects were randomly allocated to one of the research groups. To limit the extent of the test's effect on the participants in the studied groups, the first participant was appointed to the supportive care group (intervention group), and the second one was appointed to the control group. Ninety-nine eligible laboring women were invited to engage

in the current research. Eight participants failed to meet the inclusion requirements, while three subjects refused to provide their agreement to participate. As a result, 11 laboring women were excluded from the study sample, leaving 88 eligible women who were randomly

allocated to the intervention or control groups (n = 44 in each group). Eighty-eight participants were included in the statistical analysis. Figure 1 is presented the study groups flowchart.

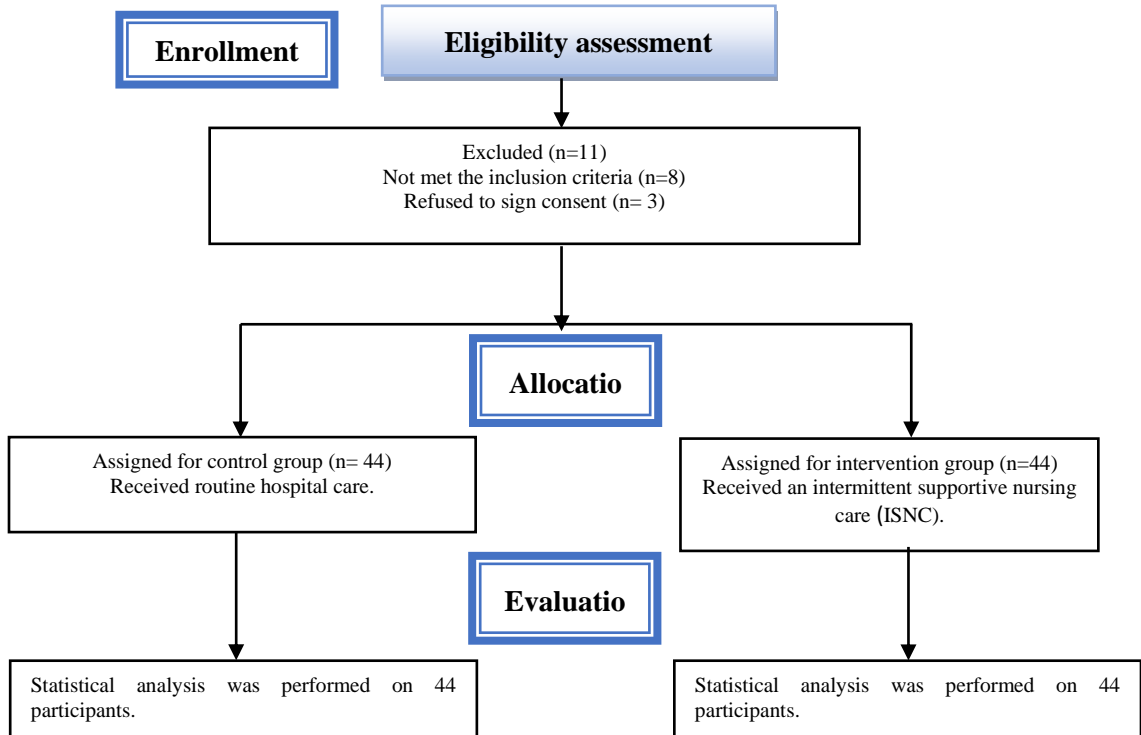


Figure 1. Flowchart of the study groups

Data collection tools

Data was collected through five tools:

Tool I: A Structured Interviewing Schedule:

The researchers developed it after extensive literature review (Akbarzadeh et al., 2016; Cicek & Mete, 2021; Ismail et al., 2022) and involved of three parts: The first part involved the laboring women demographic characteristics as age, occupation, residence, and level of education. The second part involved reproductive history of the laboring women such as number of gravidity, number of abortions, number of living children and previous delivery mode and the third part pertained to the maternal current delivery outcomes (e.g., duration of labor stages, oxytocin rate used in delivery, mode of current delivery and problems happened during labor).

Tool II: Visual Analogue Scale (VAS): It was designed by Crichton, (2001) and used to identify the labor pain intensity. The reliability of VAS was 0.896. Pain scores are relied on self-reported measures which recorded with a single handwritten mark put at one point along the length of a 10-cm line that illustrates a continuum between the two ends of the scale “no pain” on the left (0 cm) and the “worst pain” on the right (10 cm).

Scoring system

The VAS was splitted into three main parts: the first part is graded from 1 to 3 cm that indicates mild pain, the second one is graded from 4 to 7 cm for moderate pain level and finally the third part is graded from 8 to 10 cm that reflects severe pain. Higher scores indicate the worst pain.

Tool III: Childbirth Attitudes Questionnaire

(CAQ): It is a reliable tool, with an alpha equal to 0.83 that adopted from **Lowe, (2000)**. It is used to measure the fear of childbirth level. It is a questionnaire consisting of a 16-items. Each item is answered with a 4-point Likert scale (1 = no fear, 2 =mild fear, 3 = moderate fear, 4 = high fear).

Scoring system

Each component is rated between 1 and 4 points with 4 indicates the greatest fear of childbirth . Sum scores are ranged from 16 to 64, with higher scores represents a higher fear of childbirth level. A score equal to or lower than 32 reflects a low level of fear, a score between 33 and 48 equates to moderate fear and a score higher than 48 denotes a high fear level (**Abd El-Aziz et al., 2017**).

Tool IV: Neonatal Assessment Sheet: The researchers developed it after reviewing the related literatures except the part concerned with newborn's Apgar score(**Ahmadpour et al., 2022; Niazi et al., 2022**).This tool involved two parts as follows: The first part included data related to newborn's gestational age, gender, and birth weight. The second part concerned with the neonatal outcomes such as newborn's Apgar scores that adopted from **Apgar, (1953)** and contains of five objective signs (color, heart and respiratory rates, muscle tone, and reflex irritability) to evaluate their cardio-respiratory adaptation after delivery as well as admission to NICU and breastfeeding initiation within the first hour after delivery.

Scoring system

An overall score that ranging from 0 to 10 is assigned to the Apgar five signs, which are examined during the first and fifth minutes after birth and given a score of 0, 1, or 2. The infant is in a good condition, according to the 8–10 scale. A moderate asphyxia indicated by an Apgar score of 4 to 7 requires more intensive stimulation of breathing. Severe depression is indicated by a score of 0 to 3, necessitating urgent intubation and bag breathing.

Tool V: Mackey Childbirth Satisfaction Rating Scale: It was designed by **Goodman et al., (2004)** to evaluate satisfaction level of laboring women regarding their birthing

experience. It entails of 34 items, and it was modified by the researchers to 17 items by omitting 17 items from the original version because of repetition and those were inconvenient for the local policy of the assigned settings. Laboring women express their satisfaction or dissatisfaction with each item on a five-point Likert scale as follows: 1 = very dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied and 5 = very satisfied.

Scoring system

A cumulative score ranges from 1 to 5. A score of 5 indicates the greatest satisfaction. Sum scores are ranged from 17 to 85, with higher scores represents a greater childbirth satisfaction level. A score equal to or lower than 50% considers low satisfaction, a score between 50% to 75% reflects moderate satisfaction level and a score higher than 75% indicates a high satisfaction level.

Validity of the study tools

The present study tools' validity was confirmed by a panel of three experts from the Faculty of Nursing, Mansoura University in the field of Pediatric and Obstetric Nursing. Every expert evaluated the study tools for their coverage clarity, content, length, wording, format, and overall appearance. Their suggested configurations were made, such as simplifying some words to be understood, rephrasing, and omitting some sentences.

Reliability of the study tools

The internal consistency of Mackey Childbirth Satisfaction Rating Scale was assessed with the Cronbach's alpha coefficient (0.894) which indicated the high reliability of the study tool.

Pilot study

A pilot study was conducted on 10 percent of the research sample (n=9 laboring women) to assess the designed questionnaire clarity and the study tools applicability, moreover to assess the required period to collect the study sample. These laboring women were included in the study sample.

Research process

The preparatory, assessment, implementation, and evaluation phases were carried out during a

3-month period from the beginning of January 2023 to the end of March 2023 in order to achieve the research goal.

Phase (1): Preparatory phase

During the preparation phase, the researchers received an ethical approval from the Research Ethics Committee at the Faculty of Nursing, Mansoura University, and they presented the MUH administrator with an official letter from the Dean of the Faculty of Nursing, Mansoura University, to get his approval to carry out the study after its objective explanation. The researchers then gathered the related relevant national and international literature, the study tools were created and verified, and ultimately the pilot study was conducted.

Phase (2): Interviewing and assessment phase

The researchers were attended the study setting three days per week: "Sunday, Tuesday, and Thursday from 9.00 a.m. to 3.00 p.m." laboring women were interviewed individually, and the researchers introduced themselves and explained the research purpose. Every eligible laboring woman was assigned to one of the two groups after her eligibility for participation had been verified and written informed consent had been obtained. After that, initial assessment was carried out to gather demographic and reproductive data of the women. Then, laboring women were asked to complete Visual Analogue Scale (VAS) to measure the labor pain intensity, Childbirth Attitudes Questionnaire (CAQ) to measure level of childbirth fear as a baseline data.

Phase (3): Implementation of intervention

The control group

It involved 44 laboring women who only received the standard hospital care as directed by their obstetrician in accordance with the hospital care protocol (such as the administration of intravenous fluids, instructions not to eat or drink anything, move around freely through the labor, and use any comfortable position). To get the essential information, every woman was individually interviewed during their labor stages.

The intervention group

It comprised 44 laboring women who received regular hospital care as well as intermittent supportive care. The researchers were attended with each woman from the time she entered the labor unit until she delivered the fetus to offer the required labor support. The

researchers offered emotional support by preventing loneliness, upholding hygienic standards, offering assurance, encouragement, and updates on the progress of labor, closing the delivery room door to maintain privacy, covering the woman's intimate areas, and creating an atmosphere of ambient silence for listening.

Additionally, the researchers offered physical support by promoting movement, shifting the woman's position, massaging her back, and dabbing wet cotton on her lips to avoid lip instability. Each woman was told by the researchers to unwind completely and settle into a comfortable position. After that, the researchers taught them breathing exercises. Each woman was given instructions on how to breathe properly throughout the rest periods and periodically during each contraction. The researchers advised each woman to refrain from pushing during the labor first stage in order to conserve energy. During the course of the birth and delivery process, intermittent labor support was used for 20 to 30 minutes every hour, accounting for 40% of the total delivery time.

Phase (4): Evaluation phase

It entailed two post-intervention evaluations: the first one was conducted immediately after provision of the care. Laboring women were request to rate their labor pain and fear levels by VAS and CAQ, the differences between the control and intervention groups were evaluated. In the meantime, the second evaluation was conducted after labor to assess maternal outcomes as occurrence of complications. Also, for evaluating neonatal outcomes by recording Apgar scores at the first and fifth minutes, admission to NICU and breastfeeding initiation within the first hour after birth. Additionally, measure childbirth satisfaction using Mackey Childbirth Satisfaction Rating Scale.

Ethical considerations

An ethical approval was taken from the Research Ethics Committee at the Faculty of Nursing, Mansoura University in order to conduct the research study (*Ref. No. p. 0358*). Prior to the study, a written consent was obtained from whole laboring women after explanation of the nature and objective of the research study. The study participants were informed that the contribution to the current study is voluntary, and they have the right to leave the study at any time. Secrecy, safety, confidentiality and privacy were

absolutely guaranteed during the entire study. The study results were utilized as a component of the essential research as well as for publication and education.

Statistical analysis

SPSS for Windows version 20.0 (SPSS, Chicago, IL) was utilized to perform all statistical analyses. Continuous data were reported as mean and standard deviation (SD), both of which had a normal distribution. Numbers and percentages were used to convey categorical data. For variables with continuous data, the one-way analysis of variance (ANOVA) test was employed to compare more than two variables. When comparing variables with categorical data, the chi-square test (or Fisher's exact test, if appropriate) was employed. For the questionnaires used in the study, the reliability (internal consistency) test was computed. The cutoff for statistical significance was $p \leq 0.05$.

Results

Table (1) illustrates that, no statistically significant differences were found between the two groups in terms of age, residence, educational level, and occupation ($p > 0.05$). According to table (1), 52.3% of the intervention group and 47.7% of the control group were both aged 25 to < 30. In terms of residence, 56.8% of the intervention group and 50.0% of the control group were from rural areas. Regarding level of education of the studied laboring women, more than half of them (54.5% & 52.3%) at the control and intervention group respectively were highly educated. In terms of occupation, housewives made up nearly two-thirds of women in both groups.

Table (2) reveals that the laboring women in both groups were homogeneous regarding their reproductive history. Additionally, no statistically significant differences were noted between the studied groups concerning their gravidity, number of abortions, number of living children, and mode of previous delivery ($p > 0.05$). In terms of their gravidity, 50% of the intervention group and 40.9% of the control group had three or more gravidities. Regarding their number of living children, more than half of the studied laboring women among the control group had one living child while around half of them among the intervention group had two living children. In terms of previous delivery mode, 51.4% of the

intervention group and 52.9% of the control group both delivered vaginally with episiotomy.

Figure (1) indicates that, pre-intervention, no statistically significant difference was noticed between both groups regarding their labor pain level ($p = 0.169$).

Figure (2) clarifies that, post intervention, a statistically significant difference was found between both groups regarding their labor pain level ($p = 0.022$) as the laboring women at the control group had higher level of labor pain compared to those at the intervention group.

Figure (3) detects that, pre intervention, no statistically significant difference was detected between both groups regarding their level of childbirth fear as $p = 0.431$.

Figure (4) detects that, a statistically significant difference was recognized post intervention between both groups ($p = 0.006$), as the studied laboring women among the control group had higher level of fear compared to those among the intervention group.

Regarding the studied laboring women current labor outcomes, **table (3)** proclaims that, statistically significant differences were realized between control and intervention groups concerning the duration of labor stages as $p \leq 0.05$. Also, statistically significant differences were observed between both groups regarding oxytocin rate used in delivery and problems occurred during labor as $p = 0.001$ and 0.006 respectively. As well as, no statistically significant differences were attained between either group regarding the type of problems that occurred during labor and the mode of delivery as $p > 0.05$.

Table (4) exhibits that, no statistical significant differences were found between the studied newborns among control and intervention groups concerning their gestational age, gender, birth weight and NICU admission as $p > 0.05$. On top of that, more than three-quarters of them (79.5%) at the control group and the vast majority at the intervention group (93.2%) didn't admit to NICU.

Concerning the studied newborns' Apgar scores at the first minute, **figure (5)** shows that, less than half of them (47.7%) among control group and three-quarters of them (75%) among intervention group had normal Apgar scores and a statistically significant difference was noted as $p = 0.024$.

Figure (6) shows that, at the fifth minute, a statistically significant difference was observed

between both groups ($p=0.005$), as well as 52.3% of the studied newborns among the control group and the majority of them among the intervention group (84.1%) had normal Apgar scores.

Concerning the studied newborns' breastfeeding initiation within the first hour after birth, **figure (7)** displays that, more than half of them (61.4%) among the control group and the majority of them among the intervention group (88.6%) initiated breastfeeding within the first

hour after birth and a statistically significant difference was established between both groups as $p=0.003$.

Figure (8) reveals that, the studied laboring women among the intervention group had higher childbirth satisfaction levels compared to those among the control group with a statistically significant difference between both groups ($p<0.001$).

Table (1): Comparison of the Demographic Characteristics between the Control and Intervention Groups (N= 88)

Items	Control (n=44)		Intervention (n=44)		Chi-Square / Fisher's exact test	
	No.	%	No.	%	χ^2	p
Age						
< 25	11	25.0	8	18.2		
25 < 30	21	47.7	23	52.3		
≥ 30	12	27.3	13	29.5	0.605	0.739
Mean \pmSD	28.0 \pm 4.5		28.8 \pm 4.9		0.773	0.442
Residence						
Urban	22	50.0	19	43.2		
Rural	22	50.0	25	56.8	0.411	0.521
Educational level						
Read and write	1	2.3	4	9.1		
Secondary education	19	43.2	17	38.6		
High education	24	54.5	23	52.3	1.932	0.381
Occupation						
Housewife	29	65.9	28	63.6		
Working	15	34.1	16	36.4	0.050	0.823

Table (2): Comparison of the Reproductive History between the Control and Intervention Groups (N= 88)

Items	Control (n=44)		Intervention (n=44)		Chi-Square / Fisher's exact test	
	No.	%	No.	%	χ^2	p
Number of gravidity						
One	10	22.7	9	20.5		
Two	16	36.4	13	29.5		
Three or more	18	40.9	22	50.0	0.763	0.683
Number of abortions	(n=34)		(n=35)			
None	26	76.5	24	68.6		
Once	7	20.6	8	22.9		
Twice	1	2.9	3	8.5	1.132	0.568
Number of livings children	(n=34)		(n=35)			
None	1	2.9	2	5.7		
One	19	55.9	12	34.3		
Two	11	32.4	15	42.9		
Three or more	3	8.8	6	17.1	3.516	0.319
Mode of previous delivery	(n=34)		(n=35)			
Vaginal delivery without episiotomy	13	38.3	17	48.6		
Vaginal delivery with episiotomy	18	52.9	18	51.4		
Cesarean section	3	8.8	0	0.0	3.520	0.172

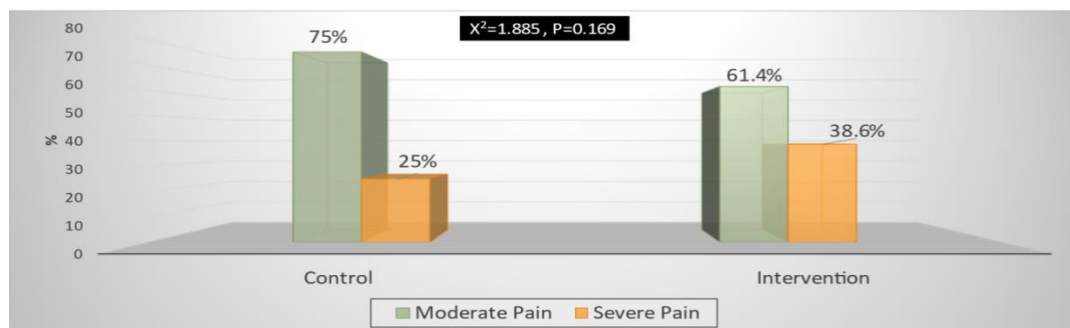


Figure (1): Comparison of the Labor Pain Level between the Control and Intervention Groups at Pre-Intervention

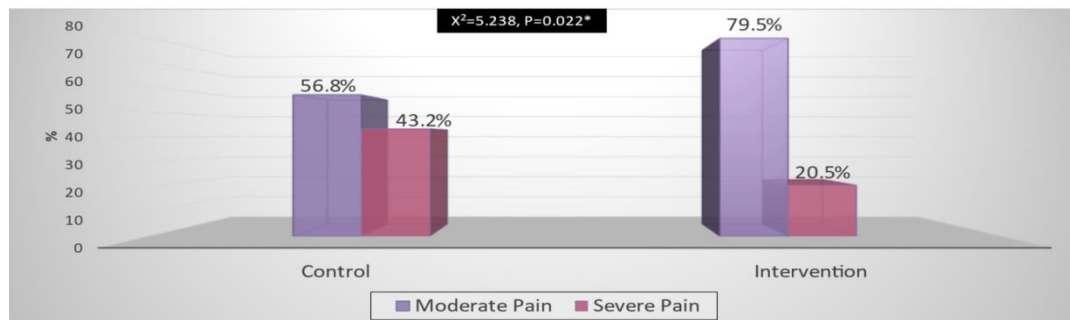


Figure (2): Comparison of the Labor Pain Level between the Control and Intervention Groups at Post Intervention

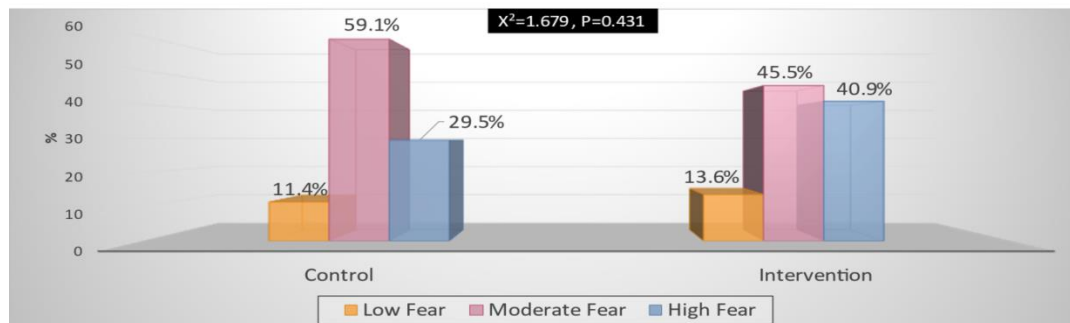


Figure (3): Comparison of the Fear of Childbirth Level between the Control and Intervention Groups at Pre-Intervention

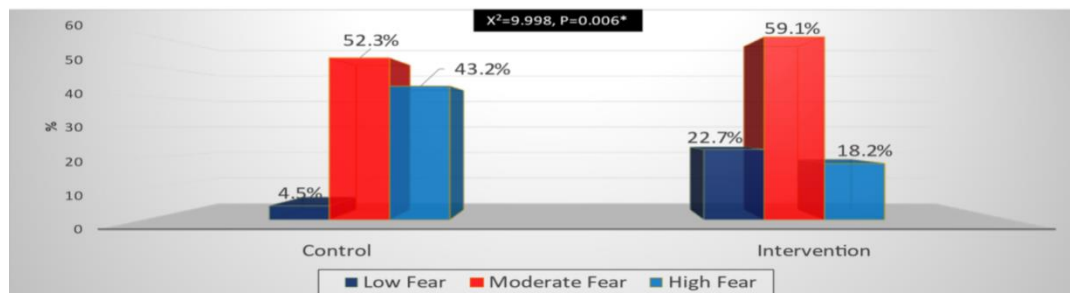


Figure (4): Comparison of the Fear of Childbirth Level between the Control and Intervention Groups at Post Intervention

Table (3): Comparison of Maternal Outcomes of the Current Labor between the Control and Intervention Groups (N= 88)

Items	Control (n=44)		Intervention (n=44)		Chi-Square / Fisher's exact test	
	No.	%	No.	%	χ^2	<i>p</i>
Duration of active phase						
< 2 hours	11	25.0	23	52.3		
2– 3 hours	17	38.6	13	29.5		
More than 3 hours	16	36.4	8	18.2	7.435	0.024*
Duration of second stage						
1 hour or less	26	59.1	35	79.5		
More than 1 hour	18	40.9	9	20.5	4.327	0.037*
Duration of third stage						
< 15 minutes	8	18.2	12	27.3		
15 – 20 minutes	36	81.8	28	63.6		
> 20 minutes	0	0.0	4	9.1	5.800	0.055
Oxytocin use in delivery						
Used	41	93.2	15	34.1		
Not used	3	6.8	29	65.9	33.196	<0.001**
Problems occurred during labor						
Yes	16	36.4	5	11.4		
No	28	63.6	39	88.6	7.568	0.066
Types of problems occurred during labor	(n=16)		(n=5)			
Retained placenta	3	18.8	2	40.0		
Laceration of birth canal	12	75.0	1	20.0		
Bleeding	1	6.2	2	40.0	5.622	0.060
Mode of current delivery						
Vaginal delivery without episiotomy	12	27.3	24	54.5		
Vaginal delivery with episiotomy	25	56.8	18	40.9		
Cesarean section	7	15.9	2	4.6	0.045	0.831

Table (4): Comparison of the Characteristics of the Studied Newborns between the Control and Intervention Groups (N= 88)

Items	Control (n=44)		Intervention (n=44)		Chi-Square / Fisher's exact test	
	No.	%	No.	%	χ^2	<i>p</i>
Gestational age						
Mean \pmSD	39.66 \pm 1.23		39.23 \pm 1.27		1.613	0.110
Gender						
Boy	18	40.9	26	59.1		
Girl	26	59.1	18	40.9	2.909	0.088
Birth weight(kg)						
Mean \pm SD	3077.10 \pm 645		3188.61 \pm 661		1.210	0.220
Admission to NICU						
Yes	9	20.5	3	6.8		
No	35	79.5	41	93.2	3.474	0.062

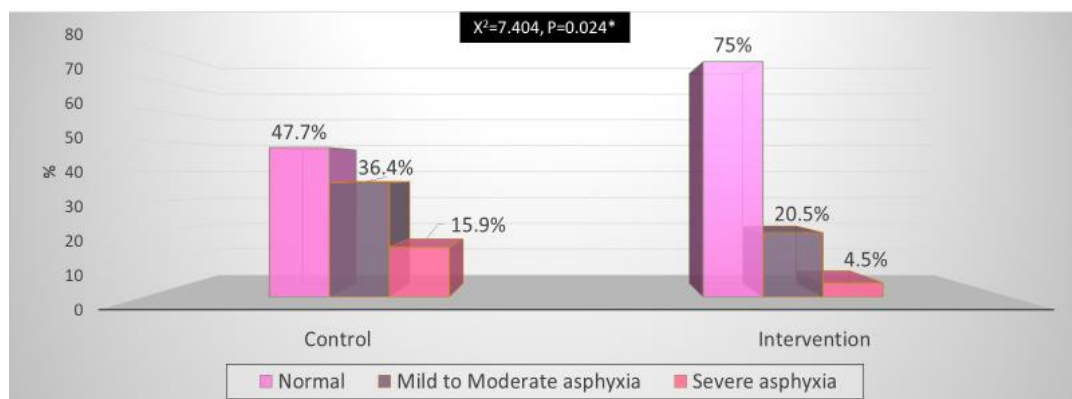


Figure (5): Comparison of the Apgar Scores of the Studied Newborns between Control and Intervention Groups at the First Minute

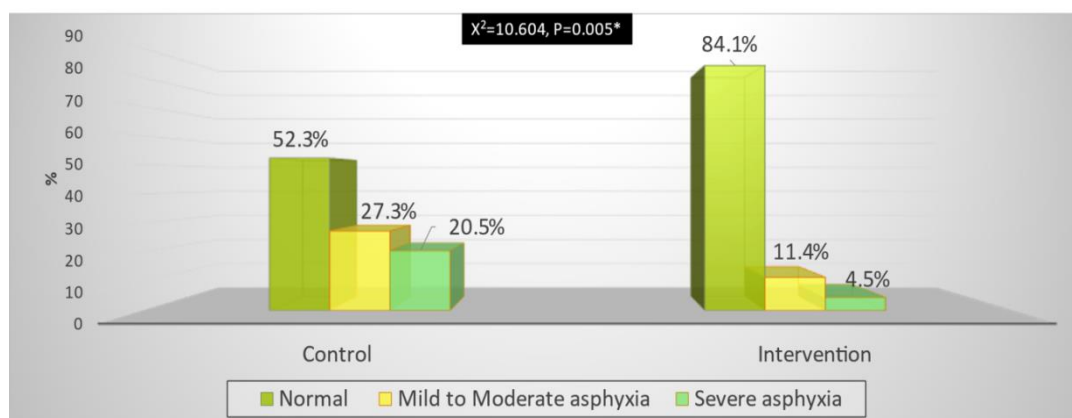


Figure (6): Comparison of the Apgar Scores of the Studied Newborns between the Control and Intervention Groups at the Fifth Minute

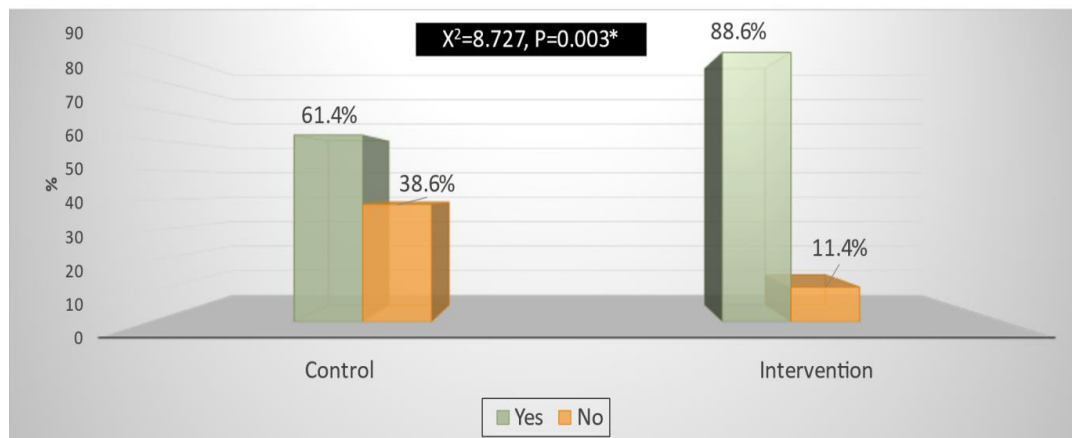


Figure (7): Comparison of the Studied Newborns' Initiation of Breastfeeding within the First Hour after Birth between the Control and Intervention Groups

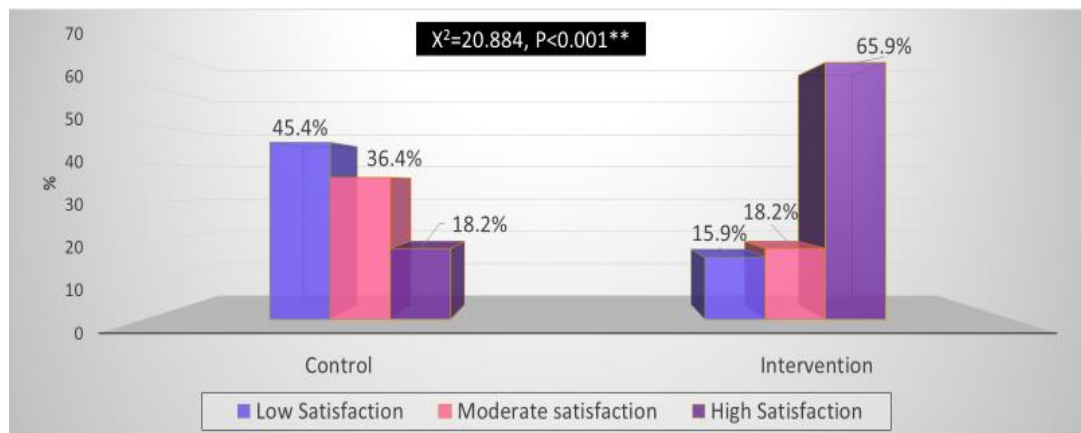


Figure (8): Comparison of the Childbirth Satisfaction Level between the Control and Intervention Groups

Discussion

The current research study was conducted to investigate the effect of intermittent maternal supportive care on pain intensity and childbirth outcomes. The findings of the current study revealed that intermittent maternal supportive care during labor effectively improves the laboring women and their newborns outcomes. So, the research study hypotheses were confirmed.

Pre-intervention, the study findings regarding the laboring women's labor pain levels showed no statistically significant difference between the two groups; however, post-intervention, a statistically significant difference was found between the two groups as the intervention group's labor pain level was decreased compared to those among the control group. The present study results are consistent with those of **Çankaya & Can, (2021)**, who conducted a quasi-experimental study in Central Anatolia, Turkey, to assess the effects of supportive care provided during labor on birth pain level and discovered that the supportive care group's pain intensity was lower than the control groups, and there was a statistically significant difference ($p < 0.05$).

Also, this finding is emphasized by a Turkish study by **Cicek & Mete, (2021)** titled: "the effects of intermittent supportive nursing care on labor outcomes", and they declared that the women in their intervention group had a lower level of labor pain through latent, active, and transition phase. Identically, **Choudhary et al., (2018)** Indian study regarding the effectiveness of labor support measures on the pain perception of mothers in

labor as they reported a significant difference of the mean pain scores of mothers among their experimental and control groups. These findings showed that the measures of labor support were efficient in decreasing the labor pain as these supportive measures enable the laboring women to cope with labor pain, be aware of their self-efficacy, minimize pain and help feel relaxed. It can be inferred that supportive care exhibits the expected behavior of delivery, enhances pain-coping skills of the laboring women, boosts self-competence and emotional state. Hence, the current study hypothesis (I) is ascertained.

The current study results indicated that, no statistically significant difference was observed between the two groups in terms of the studied laboring women's level of childbirth fear pre-intervention; however, post-intervention, a statistically significant difference was found between the two groups as the studied laboring women in the control group had higher level of childbirth fear than those in the intervention group.

The current study findings are consistent with an experimental study by **Cankaya & Can, (2021)**, who reported that women who received intra-partum supportive care experienced lower childbirth fear levels than those in the control group ($p < 0.001$). Similar results were mentioned by **Kaur et al., (2022)**, who investigated the effectiveness of supportive educational interventions on primiparous women's childbirth fear in India and they found that labor support decreased childbirth fear among the intervention group. Reduced level of childbirth fear results in

increased oxygenation of the smooth muscles and reduction in labor discomfort. This finding confirms the second study hypothesis, which stated that intermittent supportive measures lessen the childbirth fear levels.

As regards the studied laboring women's outcomes of the current labor, this study proclaimed that, statistically significant differences were found between control and intervention groups in relation to their labor stages' duration. This result is compatible with **Cicek & Mete, (2021)** who stated that the intervention allowed a decrease in all labor phases and the difference between phases durations between the groups was significant.

Furthermore, the study findings are appropriate with the findings of a randomized controlled study done by **Stjernholm et al., (2021)** in Sweden about continuous support promotes obstetric labor progress and vaginal delivery in primiparous women. They reported that the primiparous women with labor support had shorter active labor duration. The existing study result is incompatible with the result of **Ahmadpour et al., (2022)** who performed a randomized controlled study to examine the effect of implementing a birth plan on maternal and neonatal outcomes and reported that no significant difference was noted between the two groups concerning duration of active, second, and third labor phases. The finding of the present study may be attributed to women with supportive care had a lower level of stress that reinforce progress of labor as lower stress level associated with low level of cortisol during the first and the second labor stages which associated with shorter duration of the labor stages. So, the second research hypothesis is confirmed and proved that labor support could also shorten labor duration.

The intensity of pain was lower in the two intervention groups compared to the control group and the deference was statistically significant ($p < 0.001$)

The current study results reported that, statistically significant differences between control and intervention groups were existed concerning rate of oxytocin used in delivery. This result is consistent with **Cicek & Mete, (2021)** who reported that the laboring women among the control group were noticed to take more oxytocin

than the intervention group ($p=0.000$). Meanwhile, the actual study result is conflicted with **Çankaya & Can, (2021)** and **Isbir & Sercekus, (2017)** who pointed that no significant difference in rate of oxytocin used between the two groups was detected ($p > 0.05$).

According to researchers, the lower rate of oxytocin used among the intervention group can be explained by shorter labor duration and higher level of labor satisfaction because supportive care helps laboring women feel supported and, in turn, helps them adjust to giving birth. Labor support additionally promotes the peptide hormone oxytocin release that causes uterine myometrial contractions and advances labor. Moreover, oxytocin stimulates various effects which counteract stress involving empowerment, calm, and alleviation of pain, fear, and anxiety (**Uvnäs-Moberg et al., 2019; Olza et al., 2020**), and these outcomes are supported by the third research hypothesis.

Regarding the outcomes of the studied newborns, more than three-quarters of them among the control group and the vast majority among the intervention group didn't admit to NICU with no statistically significant difference. The current study finding is congruent with **Ahmadpour et al., (2022)** who communicated in their study that, three newborn infants were admitted to NICU in both groups, and no difference between the two groups ($p=1.000$). As well as this study result is proved by **Stjernholm et al., (2021)** who recognized that none of the neonates was admitted to NICU care. These supportive research studies advocate the present study research hypothesis (IV) that labor support is associated with better neonatal outcomes. The researchers attribute this result to the studied newborn infants' normal gestational age, birth weight and Apgar scores at the first and fifth minutes as previously mentioned at the actual study results.

Concerning the studied newborns' Apgar scores at the 1st and 5th minutes, the study results showed that, statistically significant differences between the intervention and control groups were noted. The actual study result is concordant with **Abd El-Fatah et al., (2020)** who carried out an Egyptian study to compare the effects of maternal supportive care and acupressure on labor pain intensity and Apgar score and stated that a

statistically significant difference was found between supportive care and control groups regarding the mean Apgar score at the first minute.

Furthermore, these research study results agree with the Egyptian study of **Ali et al., (2017)** to investigate the effects of maternal supportive care and acupressure during labor on labor pain intensity, and Apgar score and publicized that, the frequency of Apgar score ≥ 8 in the first minute was higher in the supportive care group compared to the control group with a statistically significant difference between groups ($p < 0.000$). The present study results affirm the study hypothesis (IV) and are relevant with literatures that labor support improves newborn's Apgar scores (**Akbarzadeh et al., 2016; Breman&Neerland, 2020; Farahat et al., 2015; Haghghi et al., 2016**).

Meanwhile, the existing study result is incompatible with the results of **Abd El Aliem et al., (2020)** who implemented a study to evaluate the effect of implementing birth plan on women childbirth outcomes and empowerment and confirmed that no statistically significant difference concerning Apgar scores (1 or 5 minutes) between the two groups was observed. Additionally, **Stjernholm et al., (2021)** stated in their study that the mean Apgar score at 5th minutes was comparable as it was 9.8 ± 0.4 in the standard care group and 9.8 ± 0.5 in the continuous support group ($p = 0.85$).

Regarding the studied newborns' breastfeeding initiation within the first hour after birth, more than half among the control group compared to the majority of them among the intervention group initiated breastfeeding within the first hour after birth and the difference between both groups was statistically significant. The current study results are compatible with those of **Niazi et al., (2022)**, who done a research study to examine the impact of companionship during labor on pain relief during the active phase of labor and timely breastfeeding initiation and reported that women in the intervention group (56.45%) initiated breastfeeding more frequently than women in the control group (25.81%) ($p = 0.001$).

The current study findings are in agreement with those of **Mottl-Santiago et al. (2008)**, who conducted a study to determine if there are differences in breastfeeding and birth outcomes

for women who received labor support during a hospital-based doula program compared to those who did not. They reported that women with birth support were significantly more likely to begin breastfeeding in the immediate postpartum period (within the first hour of motherhood). The percentage of labor-supported women who initiated breastfeeding within the first hour of delivery increased from 11 percent in 1999 to 40% in 2005 as a labor support was significantly associated with higher rates of early breastfeeding initiation.

Additionally, the current study result agrees with **WHO, United Nations Population Fund, World Bank & United Nations Children's Fund (UNICEF), (2015)** that assured that support during labor can result in early and frequent breastfeeding because support practices help a woman to feel competent (increases woman confidence in her abilities), in control, supported, satisfied and ready to interact with her newborn infant. The current study result confirms that labor support is associated with higher rates of early initiation of breastfeeding (within the first hour of delivery) and facilitates emotional bonding of the mother and the newborn infant. Consequently, the present study fourth hypothesis is asserted.

Regarding childbirth satisfaction level of the studied laboring women, the studied laboring women among the control group had lower levels of childbirth satisfaction compared to those among the intervention group and a statistically significant difference between both groups was recorded. The findings of the actual study are coordinated with the study result of **Youneset al., (2020)** in their Egyptian study at Damietta city about "Supportive care provided by companion during childbirth and its effect on labor progress and maternal satisfaction" and reported that most of the laboring women in the study group were satisfied with the process of labor compared to 20 percent in the control group ($p < 0.001$). Other studies by (**Abd El Aliem et al., 2020; Breman&Neerland, 2020; Choudhary et al., 2018; Cicek&Metem, 2021; Demirel et al., 2022; Farahat et al., 2015**) supported and emphasized the current study finding and the fifth research hypothesis.

In contrast, the actual study result is clashed with **Mirghafourvand et al., (2019)** who stated

in a systematic review that there was inadequate evidence to disprove or support that labor support can enhance the satisfaction with birth or birth experience. Additionally, **Stjernholm et al., (2021)** indicated that, when asked women before their discharge from the hospital about their satisfaction with delivery, the satisfaction level did not differ between both groups.

Commenting on this previous result from researchers' point of view and as evidenced from the existing related literatures, the experiences which the laboring women gain during the childbirth process are considered the essential childbirth consequences. A favorable childbirth experience implies that the woman is satisfied with the childbirth support and care she receives and feels that she and her newborn are the centers of care and attention. When obstetric nurses help laboring women to overcome labor stress by using a high degree of interpersonal skills, women's birth experiences with their satisfaction increased. Childbirth satisfaction reflects a perfect feeling about giving birth that arises from a sense of control and participation, fulfillment of expectations and needs, empowerment, power and support. Furthermore, labor satisfaction, pain and fear are interrelated concepts. It is recognized that women with more severe childbirth's fear and pain levels have lower level of labor satisfaction. Labor support decreases labor pain and fear as a result labor satisfaction increased.

Supportive care and childbirth have been interrelated throughout the registered history. However, the effect of labor support on outcomes of childbirth has only been examined over the past few decades. Research studies supply strong evidence of enhanced consequences for laboring women and their newborn infants when they are supported in labor. Obstetric nurses must be knowledgeable about labor support and executing this study in the clinical settings to improve maternal and neonatal outcomes and transform the intra-partum care.

Conclusion

The current research study was conducted to investigate the effect of intermittent maternal supportive care on pain intensity and childbirth outcomes. Within the study hypotheses laboring women who received the intermittent supportive care had lower levels of labor pain and childbirth fear, shorter duration of

laborstages, lower rate of oxytocin used in labor and higher levels of childbirth satisfaction. Furthermore, the newborn infants of the laboring women who received the intermittent supportive care had normal Apgar scores at the first and fifth minutes, not be admitted to the NICU and initiated breastfeeding within the first hour after birth.

Recommendations

Based on the actual study results, it is recommended that:

- Intermittent supportive care should be implemented routinely in all maternity hospitals to improve childbirth outcomes.
- Provide a training program to the obstetric nursing staff to improve their knowledge, attitudes and practices about supportive care during childbirth and its benefits to laboring women and their newborn infants.

Further studies are recommended to:

- Evaluate attitudes and practices of midwifery nurses about the intermittent supportive care.
- Examine the effect of intermittent supportive care delivered to laboring women on maternal postpartum depression.

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