

## Original Article

## The Effects of Intermittent Supportive Nursing Care on Labor Outcome: A Quasi-Experimental Study

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### Abstract

**Background:** Labor support can be offered intermittently or continuously. Intermittent labor support was defined as 40% of the delivery duration, and this ISNC was applied for 20-30 minutes at every hour of the birth.

**Aim:** The aim of this study was to examine the effects of intermittent supportive nursing care on labor outcomes.

**Methodology:** The study was design as a quasi-experimental study with intervention group (n=30) or the control group (n=30) by purposive sample method.

**Results:** There was a significant difference in fear of childbirth labor pain, oxytocin use, duration of labor, labor satisfaction and perceived labor support scale scores intervention group.

**Conclusion:** Intermittent supportive nursing care effectively decreases the fear of childbirth, labor pain, oxytocin use during childbirth, duration of active and transition phase and increases the labor satisfaction and perceived labor support scale scores.

**Key words:** intermittent labor support, fear of childbirth, labor pain, duration of labor, delivery nursing.

### Introduction

Childbirth is a quite important experience which has physical, psychological and emotional effects on women's life (Khreshah, 2009). Thus nurses should be familiar with women's diverse needs during childbirth (Green, 2012), including emotional, physical and informational needs (Bohren et al., 2017). To communicate positively with the pregnant during delivery could reduce fear associated with childbirth (Chan et al., 2013) and can provide a positive birth experience (Jamal, Hoga and Tanaka, 2011). Helping women cope with this experience is one of the most important roles of nurses (Charles, Yount and Morgan, 2016, Breman and Neerland, 2020). Women need to feel relaxed during labor and the least risky maternal and fetal interventions should be preferred (Gagnon and Sandall, 2007). The care model which decreases fear and loneliness of women, enables them to use their power and fulfils their needs and wishes is known to be labor support (Simkin, 2002).

Labor support, reliable and inexpensive (Barrett and Stark, 2010), is considered as more important than drug administrations and medical support (Davies and Hodnett, 2002). Supportive care during labor was defined by Barret and Stark as support for maintenance of normal birth process (Davies and Hodnett, 2002). According to Adams and Bianchi (2008), labor support is non-pharmacological pain management implemented by obstetrics nurses and researchers and supporting women during labor.

Labor support provided by nurses facilitates women's coping with labor and helps them to have a more positive perception of the intrapartum care given by nurses (İsbir and Sercekus, 2017). Labor support reduces labor fear and labor pain, shortens labor duration (İsbir and Sercekus, 2017), and increases labor satisfaction (Bohren et al., 2017). Labor support can be offered intermittently or continuously (Bohren et al., 2017). There is strong evidence that continuous labor support improves labor

outcomes (Bohren et al., 2017). However, only one research showing the effects of intermittent labor support on labor outcomes in the literature (Scott, Berkowitz and Klaus, 1999).

Supporter presence in the delivery room has become a cultural norm for many countries. Although there are no legal restrictions in Turkey, it is not allowed for the relatives of the pregnant woman to enter the birth room by health professionals. There is also no information/training on how to cope with labor in prenatal care, even though the rate of prenatal care is high (TDHS, 2019). In addition to not giving antenatal education about delivery and labor. The providing of labor support is neither routine nor common, and the characteristics of birth rooms are quite different from each other in Turkey. In some delivery rooms, each woman is in a separate room, while some 8-10 women are in the same room. Although both midwives and nurses work in delivery rooms in Turkey, the number of nurses and midwives are insufficient (OECD, 2019). It is not possible to providing continuous labor support in Turkey because of insufficient number of nurses and midwives and inconvenient delivery room environments.

This aim of this study was to examine the effects of intermittent supportive nursing care on labor outcome.

### Hypothesis

The following hypotheses were tested:

H<sub>1</sub>. ISNC reduces fear of childbirth

H<sub>2</sub>. ISNC reduces labor pain.

H<sub>3</sub>. ISNC shortens total duration of labor.

H<sub>5</sub>. ISNC increases labor satisfaction from labor.

H<sub>6</sub>. ISNC increases perceived labor support.

H<sub>7</sub>. ISNC reduces the rate of oxytocin used in labor.

### Methodology

#### Study Design and Participants

This study is quasi-experimental design, with comparison of two groups of women an intervention group and control group. It was carried out on 60 nulliparous women admitted for delivery in Dokuz Eylül University Hospital in Turkey between 2014 and 2015 by purposive sampling method.

**Inclusion and exclusion criteria:** Inclusion criteria were nulliparous women at the aged range of 19-31, and gestational age of having 37+6 to 41weeks, with a single alive fetus with head presentation and 2500-3500 gr fetal weight and cervical dilatation of 1-3 cm on admission. Exclusion criteria were women having a psychiatric diagnosis, epidural anesthesia or cesarean section at any stages of labor and wanting to leave the study were excluded.

**Data Collection Tools:** Data were collected with personal and obstetric characteristics form prepared by the researchers and four scale. Visual Analogue Pain Scale (VAPS) was developed by Price et al. in 1983 (Ip, Tang and Goggins, 2009). Visual Analogue Fear Scale (VAFS) is a valid and reliable scale to measure subjective feelings like fear except for pain (Rouhe et al., 2009). VAPS and VAFS display a line starting with zero and ending with 10. They were used before routine nursing care and ISNC and in latent, active and transition phases of labor. The Postpartum Self-Evaluation Questionnaire was developed by Lederman, Raff and Carroll in 1981. The minimum and the maximum scores for the subscale are 10 and 40 respectively. As the scores increase, labor satisfaction decreases (Lederman, Raff and Carroll, 1981). The scale was implemented in both the intervention and the control groups in the obstetric ward in postpartum 24 hours at a time when the women felt good. Women's Perception for the Scale of Supportive Care Given During Labor was developed by Uludağ and Mete in 2015 and includes three subscales, i.e. comfortable behaviors, education and disturbing behavior. Cronbach's alpha is 0.94 for the scale. The lowest and the highest scores for the scale are 33 and 132 respectively. The higher the scores obtained, the better the supportive care given. The scale was completed in postpartum 24 hours when the women felt good.

**ISNC intervention:** The researchers developed an intermittent supportive nursing care. This care initiatives were: breathing exercise, sacral massage, prevention of loneliness, provision of information, and encouraging women to be born (positive reinforcement), ensuring hygiene requirements, closing of the door of the birth room for the protection of privacy and the covering the intimate spaces of the pregnant, moistening her lips with wet cotton to prevent lip instability, and provision of ambient silence for listening. Intermittent labor support was defined

as 40% of the delivery duration, and this ISNC was applied for 20-30 minutes at every hour of the birth. The women in the control group were given routine nursing care by the delivery nurses.

**Evaluation of data and analysis of findings:** Statistical Package for the Social Sciences (SPSS) 20.0 for Windows was used for statistical analysis in this study. Data were not normally distributed. The level of significance was defined as  $<0.05$ . The study had a statistical power of 99% based on analysis of the data obtained with G Power program. Descriptive data were described as frequencies and percentages and Man-Whitney U test. Education status was evaluated with one-way variance analysis and employment status and infant gender were evaluated with Yates' correction Chi-square test. Oxytocin use and whether pregnancy was planned or unplanned were evaluated with Fisher's exact Chi-square test. Labor pain, fear and duration, mean scores for labor satisfaction subscale of Postpartum Self-Evaluation Questionnaire and mean scores for Women's Perception for the Scale of Supportive Care Given During Labor were compared between the control and the intervention groups by using Mann Whitney U test. Intragroup evaluations of fear and pain scores from both groups were evaluated with ANOVA analysis (Akgül, 2005).

**Ethical Considerations:** The research was conducted with the approval of the Research Hospital Ethical Committee (No: 463-GOA). Written permission was obtained from the institutions where the research was conducted. The purpose, benefits, risks, and content of the study were explained by the researchers and women who volunteered to participate were included in the study. The participants were informed about their rights to withdraw from the study at any time. Written informed consent was obtained from the participants. Patients' names were not included in the scale forms to preserve confidentiality.

## Results

**Sociodemographic and obstetric data:** In this study, baseline features did not differ significantly between the intervention and the control groups. This is important to show homogeneity of the groups and efficacy of ISNC. The distribution of the intervention and control groups' sociodemographic and obstetrical characteristics and using oxytocin are presented in Table 1. In the control group, the mean age of

the women was  $25.46 \pm 4.26$  years, duration of marriage was  $21.73 \pm 13.61$  months and gestational age was  $39.10 \pm 1.18$  weeks. Fifty percent of the women were high school graduates and 56.70% of the women were employed. In the intervention group, the mean age of the women was  $24.80 \pm 4.22$  years, duration of marriage was  $16.80 \pm 8.70$  months and gestational age was  $39.06 \pm 0.90$  weeks. Thirty-six point seventy percent of the women were high school graduates and 76.70% of the women were unemployed. Both the women in the control group and those in the intervention group had planned pregnancies. The intervention and control groups were similar in individual and obstetrical characteristics ( $p > 0.05$ ), outside of using oxytocin ( $p < 0.05$ ).

**Comparison of fear of childbirth, labor pain, duration of labor and labor satisfaction subscores between the intervention and the control groups:** While the analysis revealed no significant differences between the mean baseline scores in the intervention and control groups with labor pain ( $p=0.238$ ) and FOC ( $p=0.68$ ). The control group and the intervention group did not significantly differ in their mean scores in the latent phase for FOC ( $p=0.68$ ), but the intervention group had lower scores for FOC in the active and transition phases ( $p=0.000$ ). Similarly, the two groups were not significantly different in labor pain in the latent phase, the intervention group experienced less pain in active and transition phases. Duration of latent phase was not significantly different between the groups ( $p=0.238$ ), but duration of active ( $p=0.029$ ) and transition phases ( $p=0.006$ ) was significantly shorter in the intervention group. Total labor duration was  $3.26 \pm 0.62$  hours shorter in the intervention group ( $p=0.003$ ) (Table 2). The women in the control group were found to receive more oxytocin than in the intervention group ( $p=0.000$ ). The women in the intervention group had higher labor satisfaction than in the control group ( $p=0.000$ ) (Table 2).

**Comparison of mean scores for women's perception for the scale of supportive care given during labor between the control and intervention groups:** The women offered ISNC had a more positive perception of intrapartum supportive care than those given routine nursing care. There were also significant differences in the subscales of Perceived Intrapartum Supportive Care between the two groups of the women ( $p=0.000$ , Table 3).

**Table 1 Descriptive Characteristics of The Women in The Control And The Intervention Groups**

Descriptive characteristics	Control Group (n=30)		Intervention Group (n=30)		U*	p**
	$\bar{x} \pm SD$		$\bar{x} \pm SD$			
Age (yr.)*	25.46 ± 4.26		24.80 ± 4.22		416.000	0.614
Duration of marriage (mo.)	21.73 ± 13.61		16.80 ± 8.70		354.000	0.152
Gestational age (weeks)	39,10 ± 1,18		39,06 ± 0,90		429,000	0,746
Infant birth weight (gr)	3247,00 ± 293,76		3176, 33 ± 291,21		347,500	0,130
<b>Educational status</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>F****</b>	<b>p**</b>
						0.929
Secondary school	7	23.30	5	16.70		
High school	15	50.00	11	36.70		
Two-year university program	3	10.00	7	23.30		
Four-year university program	5	16.70	3	10.00	0.008	
<b>Employment</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>X<sup>2</sup>****</b>	<b>p**</b>
Employed	13	43.30	7	23.30	1.875	
Unemployed	17	56.70	23	76.70		0.171
<b>Infant gender</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>U</b>	<b>p*</b>
Female	17	56,70	15	50.00	420,000	0,608
Male	13	43,30	15	50.00		
<b>Whether pregnancy is planned or unplanned</b>						
Planned	24	80,00	25	83.30	435,00	0,741
Unplanned	6	20,00	5	16.70		
<b>Oxytocin use in delivery</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>X<sup>2</sup>*****</b>	<b>p**</b>
Used	29	96.70	13	43.30	19.979**	0.000
Not used	1	3.30	17	56.70		
<b>Total</b>	<b>60</b>	<b>100</b>	<b>60</b>	<b>100</b>		

\*Mann-Whitney U Test, \*\*p<0.05, \*\*\*One-way variance analysis, \*\*\*\*Yates' Corrected Chi-square test, \*\*\*\*\*Fisher's Exact Chi-square test

**Table 2 Comparison of labor duration, pain, fear and satisfaction scores between the intervention and the control groups**

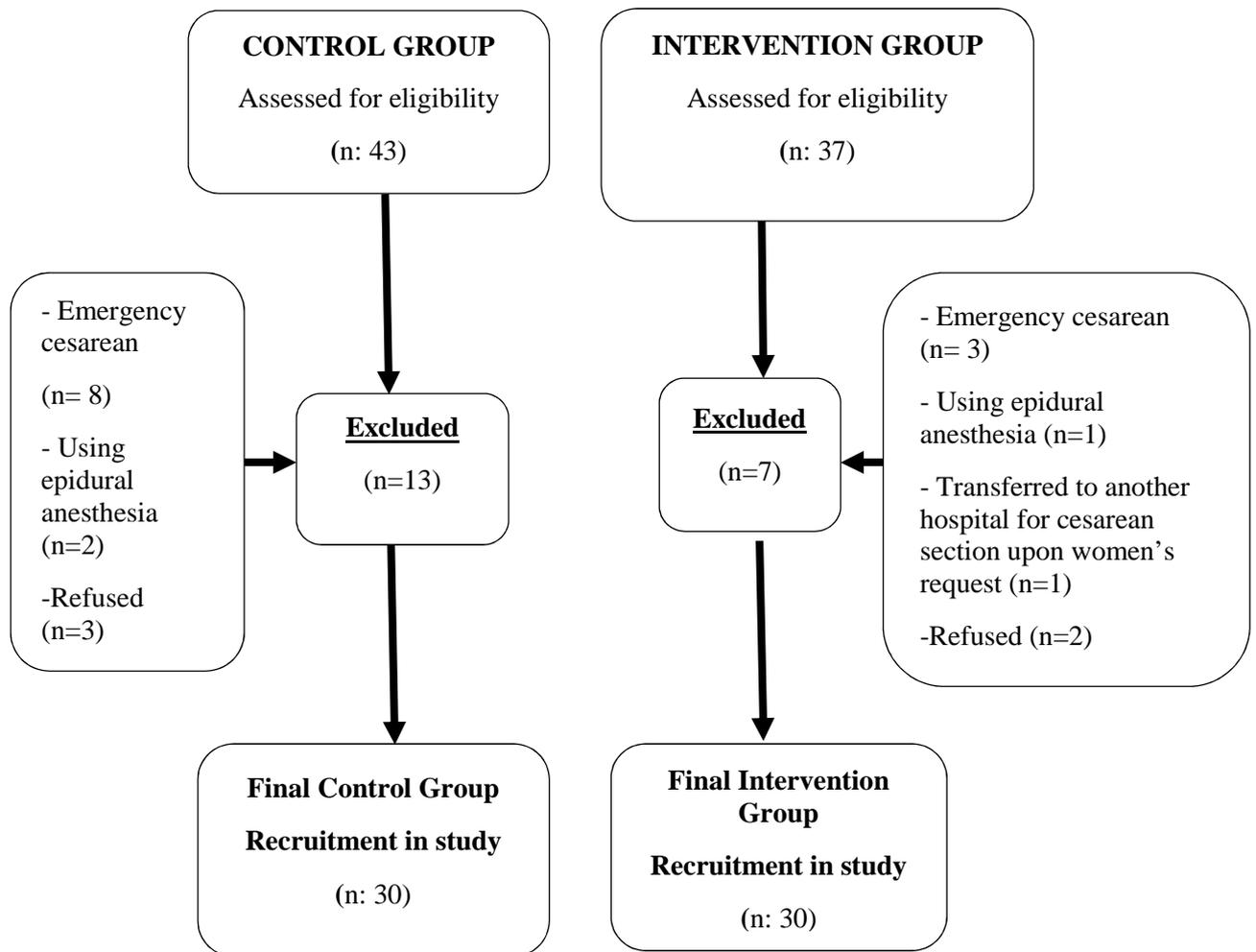
	Control Group n=30 $\bar{x} \pm SD$	Intervention Group n=30 $\bar{x} \pm SD$	U	p
<b>Mean Scores for Fear of Childbirth</b>				
Baseline				
Latent phase	4.83 ± 3.04	6.30 ± 3.15	328.000	.68
Active phase	4.83 ± 3.04	3.40 ± 1.71	309.000	.35
Transition phase	7.83 ± 3.11	3.90 ± 1.68	131.000	.000
F	9.23 ± 2.16	4.50 ± 1.79	50.000	.000
p	50.192	8.544		
	0.000	0.001		
<b>Mean Scores for Labor Pain</b>				
Baseline	5.76 ± 1.85	5.93 ± 1.33	375.000	.238
Latent phase	5.76 ± 1.85	3.53 ± 1.61	143.500	.000
Active phase	8.23 ± 1.67	6.03 ± 1.54	145.000	.000
Transition phase	9.53 ± 0.97	8.36 ± 1.29	220.000	.000
F				
p	49.257	37.771		
	0.000	0.000		
<b>Labor Duration (hr.)</b>				
Baseline				
Latent phase	7.50 ± 4.76	6.23 ± 3.53	371.000	.238
Active phase	4.33 ± 1.91	3.30 ± 1.57	305.000	.029
Transition phase	2.63 ± 1.35	1.85 ± 1.21	270.000	.006
Total duration	14.56 ± 5.84	11.30 ± 5.22	250.500	.003
Labor Satisfaction Subscale	22.13 ± 4.93	15.40 ± 5.27	161.000	.000

Notes: U: Mann Whitney U, p<0.05, F: Repeated measures of one-way variance analysis

**Table 3 Comparison of mean scores for women’s perception for the scale of supportive care given during labor between the control and intervention groups**

Perceived Intrapartum Supportive Care Scale	Min-Max Scores	Control Group	Intervention Group	U (p)
		$\bar{x} \pm SD$	$\bar{x} \pm SD$	
Comfortable Behavior	15-60	36.70 ± 4.31	58.20 ± 3.48	.000 (.000)
Education	8-32	15.96 ± 2.98	29.10 ± 0.84	.000 (.000)
Disturbing Behaviour <sup>a</sup>	10-40	33.16 ± 2.47	39.16 ± 1.74	30.000 (.000)
Total Score	33-132	85.83 ± 7.32	126.46 ± 4.38	.000 (.000)

Notes: U: Mann Whitney U Test, p<0.05, a: Involves scoring in the reverse order.



**Figure 1 Flow diagram of sample recruitment**

## Discussion

This is the first study to investigate the effect of intermittent labor support in Turkish pregnant. This study shows that intermittent labor support reduces FOC and labor pain, shortens the delivery duration and increases labor satisfaction. As a result of these positive developments, it is shown that supportive care perception of intermittent labor support is higher than that of routine care.

This study revealed that the women in the intervention group had a lower degree of FOC during active and transition phase, and labor pain during latent, active, and transition phase, duration of labor during transition phase and total delivery duration and oxytocin use. In addition this study revealed that the women in the intervention group had a higher degree of perceived intrapartum support and labor satisfaction in comparison with the control group. It has been reported in the literature that nulliparous women did not feel safe and therefore had FOC since they did not have prior birthing experience (Fenwick et al., 2015), did not know what they will encounter during labor (Fenwick et al., 2010), and did not know the health staff they will receive care (Fenwick et al., 2015). Consistent with the literature the women in the present study were found experience labor pain (Ternstrom et al., 2015). Although continuous labor support was shown to be affective in minimization FOC (İsbir and Sercekus, 2017), another study found that intermittent labor support was not reduce labor pain (Gale, Fothergill-Bourbonnais and Chamberlain, 2001).

In the current study, the women in the intervention group were offered 20-30 min ISNC every hour. The content of the supportive care was based on situations causing labor pain. This supportive care content allowed an intervention FOC of the women was reduced. However, since the intervention was just started and since more time was needed to implement appropriate nursing interventions in the latent phase, the intervention and the control groups did not differ significantly in terms of FOC in this phase. It can be suggested that if intermittent intrapartum supportive care is preceded by antepartum education, FOC can be reduced.

In this study, the intervention was also effective in the physiological mode and allowed a decrease in labor phase in all labor phases. In fact, a decrease in FOC will alleviate labor

pain.(Fenwick et al., 2010). As FOC decreases, oxygenation of smooth muscles increases and labor pain decreases (Floris and Irion, 2015). There is a meta-analysis showing a relation between intermittent labor support and labor pain, which is consistent with the finding about labor pain in the present study (Scott, Berkowitz and Klaus, 1999). Non-pharmacological interventions in ISNC like breathing exercise and sacral massage were effective for women physiological.

Sacral massage stimulated touch receptor, which reduced conduction of sense of pain (Smith et al., 2018). Breathing exercises distracted attention of the women and helped them feel less pain (Gagnon and Sandall, 2007). In addition, provision of information and encouragement, available in ISNC, allowed the women to become aware of their self-efficacy and to cope with labor pain. All the above-mentioned interventions increased release of endorphin and helped feel relaxed and reduced pain.

Most nulliparous women experience uncertainty about signs of initiation of labor and when to go to hospital and therefore they present to hospital in the latent phase of labor (Carvalho, Zheng and Aiono-Le Tagaloa, 2014). The sample of the present study also included the women presenting to hospital in the latent phase of labor. The latent phase duration was one hour shorter in the intervention group than in the control group. Although this finding was clinically important, it was not statistically significant. However, the difference in durations of active and transition phases between the groups was significant. It has also been shown in the literature that labor support is shorter in women receiving continuous labor support (Bohren et al., 2017, Kashanian, Javadi and Haghhigh, 2010). The present study revealed that intermittent labor support could also shorten labor duration, which can be considered as an important contribution the relevant literature. Since intermittent support was initiated in the latent phase and since it took time to teach women breathing exercise, decrease their fear, eliminate their feeling of loneliness and gain their trust, the difference between the groups was not significant.

It is thought that the women offered ISNC during contractions, the frequency and severity of which increased in active and transitions phases, were thought to relax and have shorter labor time. Considering that the same results can be achieved

by both continuous and intermittent labor support, it seems to be more reasonable to select the latter in terms of cost-effectiveness. The number of nurses in Turkey is insufficient (Floris and Irion, 2015), it is clear that intermittent labor support will workload per nurse and that a higher number of women will be able to receive labor support.

In the current study, the women given ISNC had higher satisfaction with their labor experience. Labor satisfaction and labor pain are interrelated concepts. It is known that women with more severe labor pain have lower labor satisfaction (Carvalho, Zheng and Aiono-Le Tagaloa, 2014). While labor support increases labor satisfaction, interventions performed during labor lower satisfaction with labor experience (Hodnett, 2002). However, several studies have pointed out that continuous labor support increases labor satisfaction while intermittent labor support is ineffective (Bohren et al., 2017). There have been enough studies to show effects of intermittent labor support on labor outcomes (Scott, Berkowitz and Klaus, 1999). In the present study, the intervention group received significantly less oxytocin. It is suggested that women exposed to labor induction can experience more frequent contractions and resultant tiredness and as a result have more difficulty in coping with labor. In the present study, higher labor satisfaction in the intervention group can be explained by uses of lower amounts of oxytocin.

Intrapartum nursing care is very important in that it helps women feel that they are supported and thereby adapt to birthing (İsbir and Sercekus, 2017). It is crucial that nurses giving care to women during labor should be polite, have a positive attitude, create a peaceful and safe environment and encourage women to ask questions so that women have positive thought and experience less FOC (Adams and Bianchi, 2008). Encouragement and appreciation of positive physiological responses of women during labor will help them have a positive perception of labor (Adams and Bianchi, 2008). Women having positive thoughts about nursing care will feel more relaxed, will be protected against disturbing behavior and will be given information they need during labor. Women learning about breathing exercise will have a more positive perception since they have less severe pain. In this study, ISNC created more positive perceptions than routine nursing care.

ISNC reduced FOC and pain and oxytocin use and shortened labor duration. As a result, labor satisfaction and perceived labor support enhanced. It is clear that it shows effects of intermittent labor support on labor outcomes and emphasizes this rarely implemented support.

**Conclusions:** ISNC, given during 40% of the total labor time, shortened durations of active and transitions phases of labor, reduced labor pain during latent, active and transition phases of labor and decreased fear during active and transition phases of labor. In addition, they were more satisfied with their labor experience and had a more positive perception of the supportive care given. However, duration of the latent phase and fear in the latent phases remained unchanged. Furthermore, oxytocin use, not mentioned in hypotheses of the study, decreased.

According to our findings, ISNC can be a suitable for nurses to improve labor outcomes. However, ISNC should be implemented on women with FOC and pain and the model should be tested again. There is also a need to evaluate what nurses and physicians think about ISNC.

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