International Journal of Obstetric Anesthesia (2019) 38, 66–74
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https://doi.org/10.1016/j.ijoa.2018.10.010

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ORIGINAL ARTICLE

Effect of companion presence on maternal satisfaction during neuraxial catheter placement for labor analgesia: a randomized clinical trial

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ABSTRACT
Background: Neuraxial labor analgesia is frequently achieved after placing an epidural catheter under sterile conditions. There is no consensus on the risk versus benefit of allowing a parturient's companion to remain during the procedure. We sought to assess the effect of the presence of a companion on maternal satisfaction and anxiety during neuraxial catheter placement for labor analgesia.
Methods: Healthy nulliparous parturients planning to receive neuraxial labor analgesia after admission to labor, and who had a companion with them at the time of interview, were randomized to having a companion present or not present in the labor and delivery room during neuraxial catheter placement. Participants completed questionnaires to assess maternal anxiety, pain catastrophizing and health literacy. Satisfaction was scored on 5-point Likert scale (1- highly dissatisfied, 2- dissatisfied, 3- neutral, 4- satisfied, 5- highly satisfied).
Results: A total of 143 participants completed the study. The Wilcoxon–Mann–Whitney odds ratio for a random pair of satisfaction scores for a woman with her companion present compared with companion not present was 1.93 (95% CI 1.30 to 2.81, P=0.001). Anxiety scores were decreased following the procedure (P=0.39) in both groups. Eighty-nine percent of women randomized to companion not present would have preferred to have a companion present (P <0.001) compared with only one with their companion present who would have preferred her companion to be not present (P=0.99).
Conclusion: Maternal satisfaction can be improved with the presence of a companion in the labor and delivery room at the time of neuraxial catheter placement for labor analgesia.

Keywords: Companion presence; Catheter placement; Labor analgesia; Neuraxial

Introduction

Neuraxial labor analgesia is the most effective option for the management of pain during labor. In a survey assessing changes in the obstetric anesthesia workforce in the United States (U.S.), the authors observed that the usage of patient-controlled epidural analgesia in hospitals with ≥1500 annual births was 35% in 2001 but almost 80% in a recent survey, making it one of the most common procedures performed during labor.[1] Neuraxial labor analgesia is frequently achieved after placing an epidural catheter under sterile conditions in the labor room and prior to its initiation in some hospitals the patient's companion might be asked to exit the room. Common reasons cited for asking companions to leave include increased physician stress, visitor interference, visitor safety, and medical legal concerns.[2–4] Studies have investigated the psychological effects of a companion's presence during the performance of a neuraxial procedure for labor analgesia or anesthesia and have found that the presence of a companion at placement of the epidural may either increase or decrease the anxiety level of the mother and/or the companion.[5,6] No study has examined the effect of the presence of a companion on patient satisfaction with the neuraxial procedure itself.

The main objective of this study was to evaluate the effect of a companion's presence on maternal satisfaction during neuraxial catheter placement for labor

Accepted October 2018
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analgesia at a teaching hospital. The study hypothesis was that maternal satisfaction would be higher in the group with a companion present in the room. Secondary outcomes included assessment of the difference in maternal anxiety before and after the procedure, with and without the presence of the companion.

Methods

The study was approved by the Institutional Review Board (IRB) for human subjects at Northwestern University (STU00203896). The protocol was registered at ClinicalTrials.gov (NCT02982213), principal investigator Feyce M. Peralta, registration date November 16, 2016. The study was a randomized clinical trial of pregnant women admitted to a large tertiary hospital. This manuscript adheres to the Consolidated Standards of Reporting Trials (CONSORT) guidelines. Inclusion and exclusion criteria are shown in Table 1.

A convenience sample of eligible women were screened and approached shortly after admission to the labor and delivery unit. Women meeting inclusion criteria provided informed written consent for study participation. Prior to the study commencement, two-group block randomization (1:1) using randomly selected block sizes of 4 and 8 was performed by an investigator (RJM) using a computer-generated allocation list. The study groups were a companion present, or not present, in the room at the time of the placement of the neuraxial catheter. Group allocations were concealed in sequentially numbered opaque envelopes.

Prior to the request for neuraxial labor analgesia, a member of the research team not participating in the care of the patient visited the parturient and performed the pre-procedural assessments. Participants were then given and asked to complete a six-question questionnaire designed to assess their knowledge and expectations regarding the placement of a neuraxial catheter for labor analgesia. They were also asked to complete validated psychological questionnaires assessing their health literacy, anxiety and pain catastrophizing.

The Newest Vital Sign (NVS) is a quick screening test to determine the presence or absence of limited health literacy. It contains six questions based on a nutrition label. Its premise is that patients with more than four correct responses are unlikely to have low literacy, whereas fewer than four correct answers indicate the possibility of limited literacy. The NVS has been validated among adults in primary care settings and has also been used during pregnancy.[7,8] The State-Trait Anxiety Inventory (STAI) is a psychological questionnaire commonly used to measure anxiety. It consists of twenty self-reported questions on a 4-point Likert-type scale (e.g., from "almost never," to "almost always"). The STAI measures two types of anxiety – state anxiety (anxiety about an event) and trait anxiety (anxiety level as a personal characteristic). This questionnaire has been validated among pregnant women, with higher scores positively correlating with higher levels of anxiety.[9,10] The Pain Catastrophizing Scale (PCS) is a self-reported questionnaire composed of a 13-item scale, with each item rated on a 4-point scale: 0 (not at all) to 4 (all the time), that measures catastrophic thinking related to pain.[11]

When the study participant requested neuraxial analgesia, the anesthesiology resident or fellow caring for the patient would open the sealed envelope and reveal the study group assignment. In the companion in the room group, the companion wore a face mask and remained seated in a stationary chair in front of the study participant without direct view of the sterile field. If more than one companion was present the participant could select the companion they wanted in the room. There was no suggestion made by the researchers that the decision was at the companion's discretion. In the companion out-of-the-room group, the companion waited outside the room during the performance of neuraxial catheter placement.

Supervision of residents or fellows during neuraxial catheter placement by an attending anesthesiologist occurred regardless of group allocation. Following the procedure, the resident or fellow that performed the initial procedure was asked to rate their perceived difficulty of the procedure, their ability to position the patient correctly, and their ability to palpate landmarks using a 0 to 100 scale (0 being extremely difficult to 100 being not difficult). They were also asked to rate their comfort performing the procedure on a 0 to 10 scale (with 0 being severe discomfort and 10 being extremely comfortable). The number of attempts (skin punctures) and redirection needed to place the needle were recorded.

Demographic information included maternal age, body mass index, race/ethnicity, estimated gestational age, reason for hospital admission (spontaneous or induction of labor), and cervical dilation at the time of neuraxial procedure. Pain scores were obtained before

Table 1 Subject inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
• Nulliparous parturient admitted in spontaneous labor or for induction of labor • ASA physical status class II • Able to read and speak English • Planned to receive neuraxial labor analgesia	• Absence of a companion greater than 18 years-of-age • Inability to provide informed written consent • Refusal to participate in all study-related procedures

and after neuraxial catheter placement using a 11-point verbal rating scale (e.g. from 0 to 10, with 10 being the worst pain imaginable). A combined spinal-epidural procedure was performed in standard fashion to achieve neuraxial labor analgesia. The duration of the neuraxial procedure, from procedure time-out to test dose administration, was recorded.

Once the procedure had been completed the participant was allowed to get comfortable and have their companion return to the room if they were absent. Ten minutes after administration of the intrathecal dose, a pain score was obtained. Within one hour, study participants were again approached by study personnel not involved in their care and were asked to complete two additional questionnaires: the STAI to assess their anxiety level following the procedure and then a post-procedure questionnaire. This evaluated their overall satisfaction related to the neuraxial procedure, the likelihood that they would recommend the care to others based on their experience of having the companion in or out of the room, and their likelihood of recommending the hospital to other people who were planning to give birth, based on their personal experience with their companion in or out of the room. A 5-point Likert-type scale was used for these assessments (1- highly dissatisfied/unlikely, 2- dissatisfied/unlikelys, 3- neutral, 4- satisfied/likely, 5- highly satisfied/likely).

Obstetric anesthesiology faculty who provided care to a subject in the study were queried to determine their preference for companion in or out of the room during the neuraxial procedure. Faculty were also asked open-ended questions regarding their perspective of the benefits or problems associated with having the companion in the room.

The primary outcome of the study was maternal satisfaction with overall care related to neuraxial catheter placement for labor analgesia. Secondary endpoints included change in STAI anxiety level in women with a companion present compared to those without a companion present; and the preference of the woman to have a companion present for future procedures.

The primary outcome of satisfaction was compared between the groups using the Mann–Whitney U test. The Wilcoxon–Mann–Whitney odds and 95% confidence interval confidence interval (CI) for a random pair of satisfaction score values from the companion in the room and the companion not in the room groups were determined.[12] Imbalances in preoperative characteristics and psychological testing results in the groups, prior to randomization, were compared by assessing the mean standardized differences and 95% CI of the standardized differences. Standardized differences were determined using Hedges' g for continuous variables and Cliff's delta for ordinal or dichotomous data. Post-procedure questionnaires were compared between the two groups using the Mann–Whitney U test. The difference in assigned group and the subject's preference for having the companion in the room, within each group, was assessed using the McNemar test. Differences in pre- to post-anxiety scores were compared using the Wilcoxon Signed Rank test. Anesthesiologist faculty perspectives on the benefits and disadvantages of having the partner in the room were grouped using thematic saturation. Analyses were performed by intent-to-treat. Data were analyzed using RStudio version 1.1.447 (Integrated Development for R. RStudio, Inc., Boston, MA; URL: http://www.rstudio.com/) and R version 3.5.0, release date April 23, 2018 (The R Foundation for Statistical Computing, Vienna, Austria).

A total of 150 participants, each group with a sample size of 75, was required to achieve 80% power to detect a change in the log odds ratio (θ) of 1.0 at a 0.05 significance level (alpha) using a two-sided Mann Whitney U test. The categorical probability distribution of the responses to the question regarding satisfaction in the companion not in the room group were estimated to be: highly dissatisfied – 5%, dissatisfied – 5%, neutral – 10%, satisfied – 20%, highly satisfied – 60%; with an increase in the highly satisfied group to 80% in the companion in the room group. Sample size calculations were performed using PASS 12, release date 7/28/2015 (NCSS, LLC, Kaysville UT).

Results

Subject flow is shown in the CONSORT diagram (Fig. 1). One-hundred-and-fifty parturients participated between December 1, 2016 and March 31, 2017. Seventy-five subjects were randomized to each group. In the companion not in the room group, 73 received the intervention, and 70 completed follow-up and were included in the analysis. In the companion in the room group, 75 received the intervention and 74 completed follow-up. One companion of a subject in the companion in the room group was randomized to remain in the room but was requested to leave the room by the attending anesthesiologist. This subject completed follow-up questionnaires and was included in the analysis of the group.

The pre-procedural clinical characteristics of the participants in the study groups are shown in Table 2. There were no clinically important differences. Pre-procedural patient questionnaires and psychological testing are shown in Table 3. There were no clinically important differences between the groups with respect to maternal concerns regarding the neuraxial procedure expectations and the information they had received via family, friends or social media regarding the neuraxial procedure. There was no significant difference in the STAI state or STAI trait anxiety scores and no significant difference in health literacy. There was also no significant difference in PCS scores.[13]

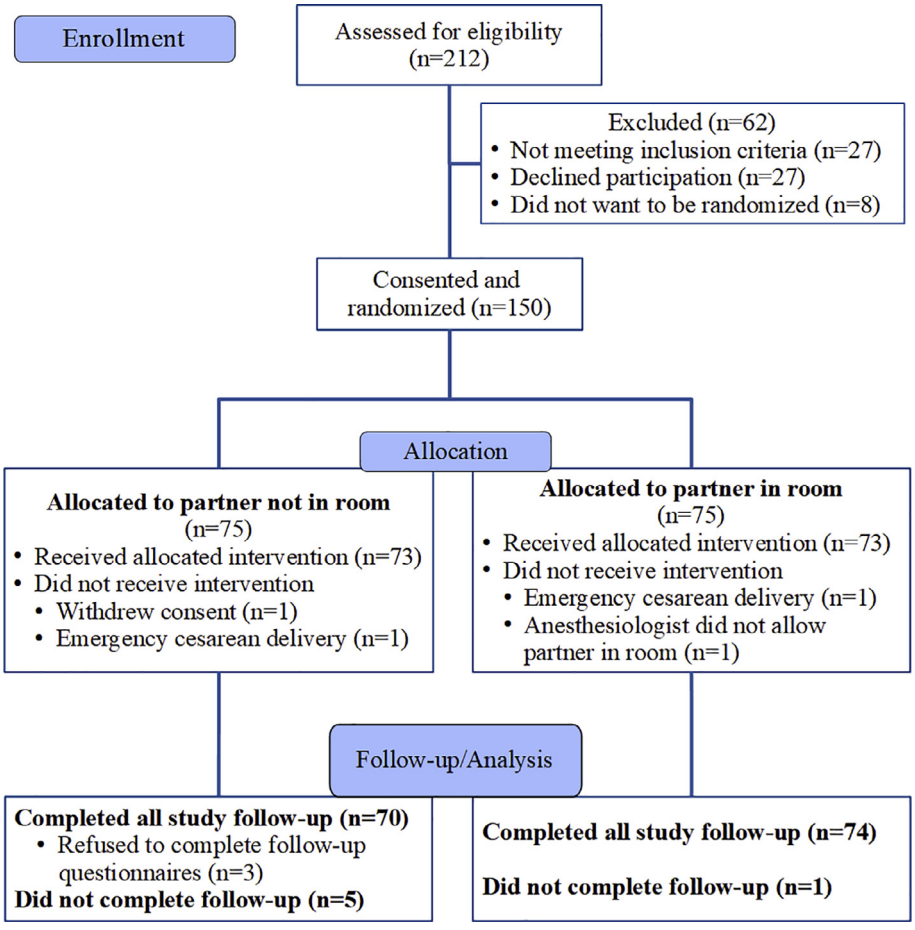

Fig. 1 CONSORT flow diagram

Table 2 Pre-procedural clinical characteristics of study groups

	Presence of companion		Standardized difference[a] (95% CI)
	Absent (n=73)	Present (n=74)	
Age (y)	32.2 ± 3.8	31.8 ± 3.6	−0.15 (−0.48–0.17)
Body mass index (kg/m^2)	29.2 ± 4.7	29.6 ± 7.3	0.07 (−0.26–0.39)
Race/ethnicity			
White	52 (71)	48 (65)	−0.07 (−0.22–0.08)
African American	4 (6)	5 (7)	
Asian	11 (15)	11 (15)	
Latino/Hispanic	6 (8)	10 (13)	
Gestational age (weeks)	40 (39–41)	40 (39–41)	0.04 (−0.29–0.37)
Labor type			
Induction	44 (60)	38 (52)	−0.02 (−0.18–0.14)
Spontaneous	29 (40)	36 (48)	
Cervical dilation (cm)	3 (2–4)	3.5 (2–4.5)	0.10 (−0.24–0.45)
NRS pain score (0 to 10) at request for neuraxial analgesia	7 (6–8)	7 (6–8)	0.004 (−0.32–0.33)

Data are mean ± SD; median (quartiles) or n (%).

[a]Standardized differences reported as Hedge's g for interval data and Cliff's delta for dichotomous data. CI: confidence interval; NRS: numerical rating scale.

Table 3 Pre-procedure patient questionnaire and psychological testing

	Presence of companion		Standardized difference[a] (95% CI)
	Absent (n=73)	Present (n=74)	(95% CI)
Labor epidural procedural expectations			
None	4 (5.5)	4 (5)	
Short procedure minimal pain	49 (67)	53 (72)	
Long procedure pain not mentioned	3 (4)	0 (0)	−0.06 (−0.21–0.09)
Painful procedure	13 (18)	13 (18)	
Other than pain or duration	4 (5.5)	4 (5)	
Greatest concern regarding epidural procedure			
Pain during procedure	23 (31)	20 (27)	
Unable to tolerate procedure	4 (6)	4 (5)	
Ineffective analgesia	17 (23)	14 (19)	−0.10 (−0.28–0.08)
Complications	23 (32)	28 (37)	
Other	6 (8)	9 (12)	
Have you spoken to friends or family about labor epidurals?			
Yes – positive comments	53 (73)	49 (66)	
Yes – mixed comments	13 (18)	13 (18)	−0.16 (−0.30–−0.01)
Yes – mostly negative comments	1 (1)	3 (4)	
Did not respond	6 (8)	9 (12)	
Researched epidurals through social media?			
Yes	37 (51)	43 (54)	0.06 (−0.11–0.22)
No	36 (49)	31 (46)	
Relationship of primary companion			
Male partner	62 (83)	65 (87)	
Female partner	10 (13)	6 (8)	
Brother	1 (1)	0 (0)	0.04 (−0.07–0.16)
Aunt	0 (0)	1 (1)	
Friend	2 (3)	3 (4)	
How long have you known your companion? (y)	7.5 (6–11)	7 (5–11)	−0.07 (−0.41–0.25)
Work in medical field?			
Yes	12 (17)	12 (16)	−0.004 (−0.12–0.12)
No	61 (83)	62 (84)	
Pain catastrophizing scale			
Median (quartile)	12 (8–22)	17 (11–22)	0.30 (−0.03–0.63)
Upper quartile	18 (25)	23 (31)	0.06 (−0.08–0.25)
Newest vital sign			
Good health literacy	62 (83)	65 (88)	0.40 (−0.08–0.16)
Low health literacy	13 (17)	9 (12)	
State-Trait (STAI) Anxiety Inventory			
State	38 (31–46)	38 (32–50)	0.13 (−0.18–0.46)
Trait	29 (26–35)	31 (26–37)	0.08 (−0.24–0.40)

STAI values are median (quartrile); Data reported as n (%).
[a]Standardized differences reported Cliff's delta for dichotomous data. CI: confidence interval.

Subject satisfaction with the overall care they received during the neuraxial procedure is shown in Fig. 2. Ninety-six percent of women randomized to have the companion in the room reported that they were highly satisfied or satisfied with the care they received, compared to 77% of those with the companion out of the room (difference 19%, 95% CI 7% to 31%, P <0.001). The Wilcoxon–Mann–Whitney odds for a random pair of satisfactions scores to be greater from a woman with her companion present compared with companion not present was 1.93 (95% CI 1.30 to 2.81, P=0.001).

Other post-procedural outcomes are shown in Table 4. Women randomized to the companion in the

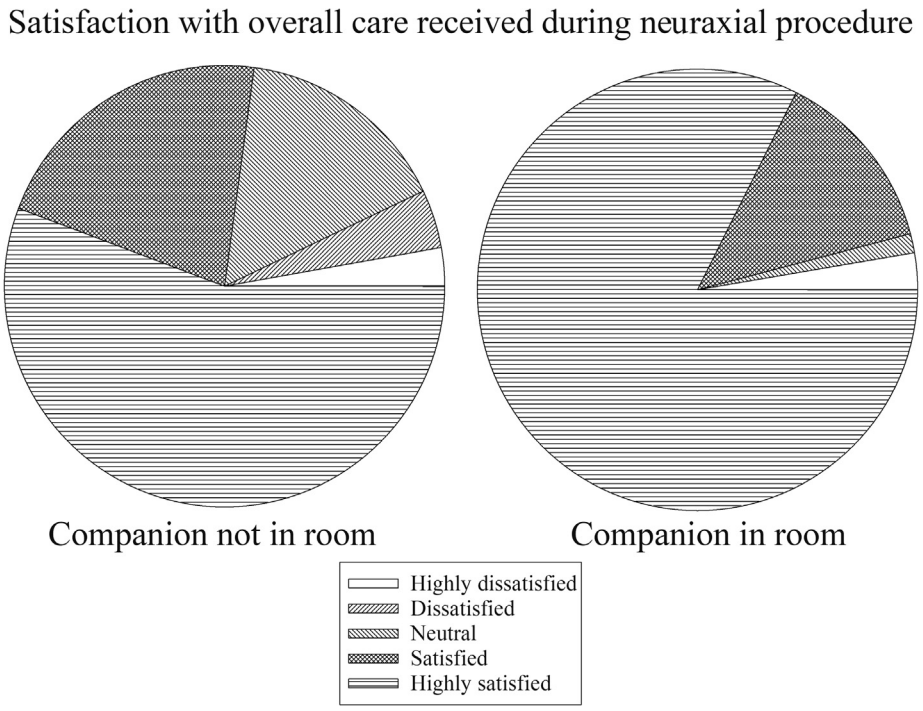

Fig. 2 Pie charts of the distribution of the response to the question regarding the participants' satisfaction with the overall care they received during the neuraxial procedure. A 5-point Likert-type scale was used for this assessment

Table 4 Post-procedural pain, duration of procedure, anxiety and satisfaction

	Presence of companion		*P*
	Absent (n=70)	Present (n=74)	
NRS pain score (0 to 10)	0 (0–0)	0 (0–0)	0.68
Procedure time (min)	16 ± 6	16 ± 6	0.89
State-Trait (STAI) Anxiety Inventory (score)			
State	28 (22–37)	27 (23–32)	0.48
Trait	27 (24–34)	28 (24–33)	0.67
Preference to have companion in or out of room			
In	65 (89)	73 (99)	0.05
Out	7 (10)	1 (1)	
Did not respond	1 (1)	0	
Recommend care received based on experience of companion presence in room			
Highly likely	32 (44)	59 (80)	<0.001
Likely	10 (14)	11 (15)	
Neutral	22 (30)	2 (3.5)	
Unlikely	3 (4)	0 (0)	
High unlikely	3 (4)	2 (2.5)	
Did not respond	3 (4)	0	
Would policy to allow companion to be present during epidural procedure affect your recommendation of care received?			
Highly likely	17 (23)	30 (41)	0.03
Likely	14 (19)	15 (20)	
Neutral	22 (30)	14 (19)	
Unlikely	7 (10)	5 (7)	
High unlikely	10 (14)	10 (13)	
Did not respond	3 (4)	0	

Data presented as median (quartiles) or number (%). NRS: numerical rating scale.

room were more likely to state that they would recommend the care they received to others, based on their experience of having a companion in the room (Wilcoxon–Mann–Whitney odds 2.39, 95% CI 1.59 to 3.54, $P<0.001$). Patients in the companion in the room group were also more likely to suggest that a hospital policy allowing the companion to be present would affect their likelihood of recommending the care they received (Wilcoxon–Mann–Whitney odds 1.53, 95% CI 1.05 to 2.22, $P=0.03$). There were no differences in post-procedure pain scores, duration of the procedure or STAI anxiety scores inventory. Median (quartile) pre- to post-STAI state anxiety scores differences were −7 (−1 to −13) in the companion not in the room group compared with −11 (−3 to −17) in the companion in the room group ($P=0.15$). When questioned post-procedure if she would prefer the companion in or out of the room, 89% ($P<0.001$) of women in the companion not in the room group stated they would prefer their companion in the room, and 99% ($P=0.99$) of the women with the companion in the room stated they preferred the companion in the room.

Procedures were initially performed by an anesthesiology resident, except for two that were performed by an obstetric anesthesiology fellow. There was a total of 50 residents and 15 attending anesthesiologists involved in labor analgesia management of the study participants. There were 107 unique combinations of resident/attending pairs, with the median number of combinations being 1 and the range 1–5 procedures. There was no difference in the level of training of the anesthesiology resident/fellow between groups (Table 5). There was also no difference in the number of attempts, procedures taken over by faculty and resident assessment of difficultly in performing the procedures. Resident-reported comfort in performing the procedure was not significantly different between the groups.

Sixteen anesthesiology faculty were surveyed regarding their preference for having the companion present or not present in the room during the neuraxial procedure (Table 6). Six (37.5%) reported that their preference was not to allow the partner in the room. The most frequently cited benefits of having the companion in the room was to decrease maternal anxiety and to

Table 5 Labor epidural performance assessment

	Presence of companion		*P*
	Absent (n=70)	Present (n=74)	
Trainee level			
Clinical anesthesia 1	6 (8)	6 (8)	
Clinical anesthesia 2	48 (69)	46 (62)	0.50
Clinical anesthesia 3	16 (23)	20 (27)	
Fellow	0	2 (3)	
Number of attempts			
1	59 (84)	65 (88)	
2	5 (7)	5 (7)	0.39
Not recorded	6 (9)	4 (5)	
Number of attending anesthesiologist takeovers	8 (11)	4 (5)	0.19
Resident assessment of difficulty of procedure (0 to 100)[a]	80 (50–90)	78 (44–90)	0.42
Resident assessment of ability to position patient (0 to 100)[a]	77 (65–90)	78 (70–90)	0.73
Resident assessment of ability to palpate landmarks (0 to 100)[a]	78 (50–93)	70 (48–87)	0.31
Resident comfort performing procedure (0 to 10)[b]	8 (6.5–9)	8 (7–9)	0.84

Data presented as median (quartiles) or number (%).
[a]=0 being extremely difficult to 100 being not difficult.
[b]=with 0 being severe discomfort and 10 being extremely comfortable.

Table 6 Attending anesthesiologists most frequently cited pro and con attitudes regarding companion presence during labor neuraxial procedure

Benefits	Problems
Reduce maternal anxiety	Increase difficulty for teaching
Emotional support	Distracting to care team
Distract the patient	Increase tension/anxiety
Hold the mother in position	Increase tension of resident physician
No positive reasons	Increase duration of the procedure
Patient satisfaction	
Transparency	

add emotional support; whereas, increased difficulty for teaching and distraction to the care team were the most frequently cited reasons to have the companion remain out of the room.

Discussion

The important finding of this study was the demonstration of the substantial effect of allowing the companion to remain in the room, during neuraxial catheter placement, on maternal satisfaction with the care they received, the likelihood of them recommending the care based on their experience, and the likelihood of them recommending the hospital if a policy to allow the companion to be present was in place. Given the substantial shift in satisfaction and likelihood to recommend observed in our study, our findings suggest that allowing a companion to stay in the room with the parturient should be considered by the provider, even in academic hospitals in teaching situations.

Although the attending anesthesiologists at our institution cited reduction in the maternal level of anxiety as a prime benefit of allowing the partner to remain in the room, we did not observe a significant difference in the level of anxiety between the partner in or out of the room groups, before or after the procedure. Because the STAI and PCS assessments were completed prior to randomization, it is possible that our findings of low levels of anxiety and pain catastrophizing prior to the procedure reflect an assumption on the part of the participants that their companion would not remain in the room, as at the time of this study our hospital policy was to not allow the partner to remain. We believe that the low levels of anxiety and pain catastrophizing more likely demonstrate a greater understanding by our patients of the risks and benefits of neuraxial labor analgesia, which is supported by our NVS results. There was no increase in procedure time with the partner present in the room, suggesting that teaching was not substantially impacted.

Previous studies have assessed the effect of a companion's presence on maternal and partner anxiety levels. Orbach-Zinger et al. assessed whether the presence of a partner during the initiation of neuraxial labor analgesia reduced the stress of both the mother and her partner and their perception of maternal pain.[5] The authors observed an increase in anxiety levels in participants with the partner-present group compared to those in the partner-not present group during catheter placement (8.0 [7.0–10.0] versus 7.0 [5.0–9.0]; P=0.03, difference in medians −1.0; 95% CI of difference −2.0–0.0). Maternal satisfaction was not assessed and the procedure was performed by the same experienced anesthesiologist in all cases. The large busy environment of a tertiary care hospital and the large number of anesthesiologists and residents that cared for patients in our study may have contradicted their findings.

In contrast, Prabhu et al. found a small decrease in anxiety levels among participants whose partners were present for a neuraxial procedure in the operating room before cesarean delivery.[6] Anxiety was increased following the procedure among partners that were not present in the room. This study was also conducted at a teaching hospital and resident physicians participated in patient care. Maternal satisfaction was not affected by the presence of the partner in the room in this study. In contrast to our study, participants were not in pain at the time of the neuraxial procedure, since it was done prior to surgery in non-laboring women. Therefore, the results of that study might not be applicable to laboring patients.

Other studies have evaluated the presence of a companion on maternal, fetal and labor outcomes and satisfaction with the overall labor experience. Authors of a Cochrane review concluded that women allowed the continuous support of a companion during labor may be more likely to give birth 'spontaneously' and may be more likely to be satisfied and have a shorter length of labor. More importantly, they found no evidence of harm from continuous labor support.[14] Cook and Loomis, using a qualitative approach, assessed the impact of the parturient's exertion of choice and control during birth, and concluded that positive and negative recollections of the process were more dependent on their feelings than on the specific details of the birthing experience.[15] Given the overall positive effects of companion presence, many organizations have advocated for continuous support during labor, although stop short of making specific recommendations regarding the neuraxial procedure policy.[16–18]

When looking at other specialties, there are several studies evaluating the presence of family during medical care, especially in the pediatric, critical care, and trauma literature. The pediatric literature has an abundance of information on family presence for invasive procedures, induction of general anesthesia, and during cardiopulmonary resuscitation. Family presence is generally considered positive, by both parents and medical care providers.[19,20] Not surprisingly, however, no studies specifically examine the pediatric patient's perspective and/or satisfaction with family presence. In the adult critical care population, resuscitation outcomes were not impacted by family presence and psychological outcomes for family members may be improved by being present for their loved one's resuscitation.[21] Robinson et al. found that family members present during their loved one's resuscitation had decreased anxiety and depression scores and the surviving patients themselves were comforted by their family's presence.[22] In 2000, the American Heart Association was the first organization to endorse that parents be given the option to be present for their child's procedures, and other organizations (the American Academy of Pediatrics, the American College of Emergency Physicians, and the Society of

Critical Care Medicine) have since followed suit.[20] Despite this, the practice is inconsistent and hospital guidelines are few.

The results of our study should only be interpreted in the context of its limitations. Our sample was primarily Caucasian with mid- to high-socio-economic status. Additionally, most of the companions were married to the study participants. Consequently, the results of this study might be less generalizable to a population that is less homogenous, as it is possible that specific demographics may be less affected by the presence of a companion during the procedure. Also, the relationship between the study participant and the companion, such as a mother/daughter, may yield different outcomes. In addition, differences in the level of support provided by the companion to the study participant during the neuraxial catheter placement could affect anxiety and satisfaction, and we limited the role of the companion by study design. Future studies should account for medical co-morbidities, multiparity and include non-English-speaking patients. These factors could affect the levels of maternal satisfaction, anxiety, pain catastrophizing and the likelihood to recommend having a companion present during neuraxial catheter placement.

In conclusion, our study demonstrates the positive effect on maternal satisfaction and the likelihood to recommend the care they received, by allowing the presence of a companion during a neuraxial catheter placement for labor analgesia. While this option should be evaluated on a case-by-case basis, it can be considered a positive option to be used when appropriate.

Conflicts of interests

The authors have no conflict of interest to disclose.

Declarations of interest

None.

Funding

This study was supported by the Department of Anesthesiology at Northwestern University Feinberg School of Medicine.

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