How we prepare: Childbirth preparation methods and their effects on satisfaction and labor outcomes

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What is the best way for first-time parents to prepare for childbirth? Overwhelmingly, women and their partners value formal childbirth education classes, books, and the emerging Internet-based resources. Do these sources meet the needs of first-time parents? We conducted an online survey of 120 participants. We found that participants that had nobody present for continuous support during labor were also unlikely to prepare for childbirth using any method. Participants that had a spouse present for support during labor were five times more likely to use pharmacological methods of pain relief. Having a midwife is grossly underrated. A small fraction of participants would recommend talking to a midwife to prepare for childbirth, yet women with a midwife are much more likely to be satisfied with their births, less likely to use drugs in labor, and more likely to use natural methods of pain relief. Preparation by childbirth class was associated with higher feelings of preparedness. Participants that prepared by talking to their doctor were more likely to have an instrumental birth. Finally, we found that women and their partners possess enough information about breastfeeding to breastfeed successfully; a lack of education is not a reason women choose against breastfeeding.

How do expectant parents prepare for childbirth, and how do these choices effect the birth experience they will ultimately attain? What is lacking in childbirth preparation? Is "just doing it" really the best preparation? What preparation methods generate the best results? How do we measure the "best" outcome of childbirth preparation?

We investigate what makes childbirth preparation successful, and propose four additions to traditional childbirth education classes, which, when used as a vehicle for change, is most likely to reach a large number of women and their birth partners, to increase satisfaction with the birth experience and the feelings of preparedness among first-time parents.

It is apparent from the literature review that childbirth preparation is related to satisfaction regarding childbirth or the choice of childbirth method. However, many of these studies have a limited user base and focus on a few types of childbirth preparation methods. In this paper, we bridge this body of knowledge by asking about a larger number of common ways to prepare for childbirth than the reviewed literature, and finding associations between the childbirth preparation, feelings of preparedness, learning in childbirth, and overall satisfaction with the birth experience.

We acknowledge the women and their partners that generously gave their time to fill out our survey.

Relevant Work

The Listening to Mothers survey (Declercq, Sakala, Corry, & Applebaum, 2007) summarizes the habits of American women in preparing to conceive, preparing for labor and birth, the birth outcomes and statistics, and postpartum demographics, including breastfeeding incidence and duration.

There has been a significant amount of research about the benefits of childbirth preparation. Lumley and Brown showed that attenders of childbirth education classes did not show increased satisfaction with their birth experience compared to the non-attenders (Lumley & Brown, 1993). Nichols came to the same conclusion: attending childbirth class did not have an effect on childbirth satisfaction (Nichols, 1995). Fabian, et al. found that although there were no statistical differences between attenders and non-attenders of childbirth class in terms of birth experience, those that attended classes were

more likely to opt for an epidural during labor (Fabian, Rådestad, & Waldenström, 2005).

Goodman, et al. showed childbirth satisfaction was influenced by whether the expectations for labor and delivery were met (Goodman, Mackey, & Tavakoli, 2004). Morgan, et al. described that effective pharmacological pain relief was insufficient for determining maternal satisfaction with labor (Morgan, Bulpitt, Clifton, & Lewis, 1982).

Methods

Participants were recruited as part of coursework in an undergraduate human-computer interaction class, open to all majors. Eligible participants had experienced vaginal or Caesarean childbirth, or had assisted their partner in having a child, in the role of main support person. Only one participant per family was eligible to complete the survey. Of the 125 individuals that started the survey, 120 eligible participants completed it in its entirety. Survey responses were collected in the last weeks of May, 2010. The only participants excluded from the study were minors under age 18, and participants that did not fit the eligibility criteria yet still completed the survey. The study received exemption from the Institutional Review Board (IRB) as part of the coursework. The IRB exemption number is 1308. Data were analyzed using IBM SPSS 18.0.

Results

The following subsections summarize our results.

Participants

Most of the participants (70%) were women that gave birth to at least one baby. The remaining 30% replied that their partner or spouse had given birth to at least one baby. Figure 1 shows this demographic.

The mean number of births per participant was 2.2, with the mode of 2. The births occurred between 1934 and 2009 (with an average birth year 1990, and mode 1988) in the United States and abroad, including Argentina, Canada, China, France, Philippines, Russia, Singapore, and Taiwan.

The self-reported instrumental delivery rate, deliveries in which forceps or vacuum extraction were used, was 24%. The Caesarean section rate was 45% across all participants, and 39% across all births (i.e., normalized), which included first-time and subsequent births. Twenty percent of first-time mothers had Caesarean sections. These numbers are illustrated in Figure 2. The Caesarean section rate in this study was significantly higher than the US average, reported to be 30% of all births (Althabe & Belizán, 2006), and higher than the 32% average rate reported in the Listening to Mothers survey (Declercq et al., 2007). Caesarean section rates

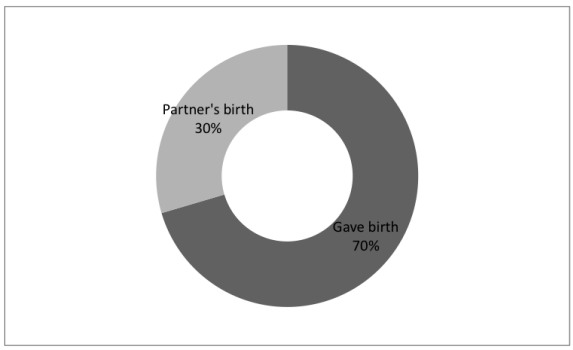

Figure 1. Who gave birth? Mothers and support persons demographic

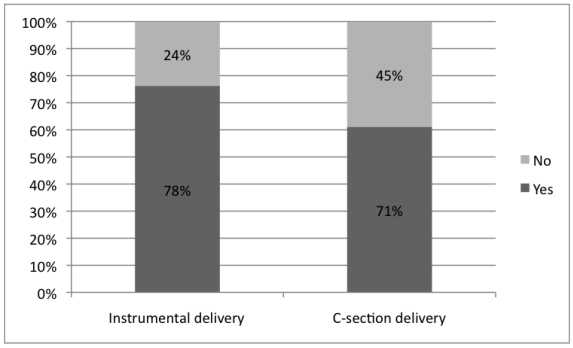

Figure 2. Instrumental and Caesarean section delivery rates

of over 10% are considered detrimental to maternal and infant health (Belizán, Althabe, & Cafferata, 2007).

Participants reported that 62% used a pharmacological method of pain relief (e.g., narcotic, epidural, spinal). This is lower than the average reported by the Listening To Mothers survey (76%) (Declercq et al., 2007).

The average birth weight of first babies was 3.33kg.

The remainder of the survey focused on the participants' first birth experience.

Preparing for childbirth

Experts in the field of childbirth were consulted to compile a list of the most common ways to prepare for childbirth. The experts were childbirth educators, doulas, and doula trainers. The finalized list included talking to a woman who has given birth (e.g., mother, sister, friend); talking to a man whose partner has given birth (e.g., father, brother, friend); taking childbirth preparation classes; reading books, watching videos, and reading Internet sites; talking to a doctor; and talking to another professional (e.g., doula, midwife).

We asked participants four questions about their methods of preparing for childbirth.

1. Preparation: How did you prepare for labor and childbirth?

2. Usefulness: Which method of preparation did you find to be most helpful?

3. Repeat preparation: If you were to go back in time and have your baby again, how would you learn about the labor and childbirth process?

4. Recommendation: If your good friend were going to have a baby, how would you recommend that she learn about the childbirth process?

Multiple answers were allowed only for the preparation, repeat preparation, and recommendation questions. Write-in answers were coded and counted. One-sample chi-square tests showed asymptotic significance $p < 0.01$ for all items.

We found that the overwhelming majority of participants (81%) prepared by talking to other women that had given birth, and 26% of participants found this to be the single most useful method of preparation — the second-largest most-useful method. However, less than half of participants (48%) would recommend preparing by talking to other women.

The second-most popular way to prepare for childbirth was through books, videos, and other media (77%). and 20% of participants thought this was the most useful method. 63% of participants would recommend books and other media to their friends. Not surprisingly, the Internet is gaining popularity, and is ranked among the most influential methods of gaining information about pregnancy and childbirth (Handfield, Turnbull, et al., 2006).

Most (63%) of participants reported preparing for childbirth by taking childbirth preparation classes. Childbirth education classes were seen as the most helpful method of preparation, marked as most useful by 35% of participants. Most participants (71%) would choose to take childbirth classes if they could repeat their preparation. That is, participants that did not prepare by childbirth class wish they had. Finally, 82% of participants would recommend childbirth classes to their friends.

Discussing the coming birth with a doctor was a method 56% of participants used to prepare. About a tenth (11%) of participants marked this as the most useful method of preparation. However, only 43% would prepare this way again, indicating that 13% of those that prepared by talking to a doctor would not choose to do this again. More than half (56%) of participants would recommend to a friend to prepare by talking to a doctor.

Talking to another professional, such as a doula or midwife, was a method 29% of participants used (although only one participant used a doula in the birth). A strikingly low 3% of participants thought this was the most useful method of preparation, although our data show that this is the most overall beneficial way to feel supported in childbirth. Only 10% of participants said that a midwife was present at the birth for continuous labor support, indicating that some participants either spoke with midwives and doulas to prepare, and subsequently chose medical care through family doctors and obstetricians, or some midwives were not present for the entire labor and childbirth process for continuous support. Regardless, 43% would recommend this method of preparation to friends, indicating that new parents recognize the positive influence a midwife or doula can have on a birth experience and birth outcome.

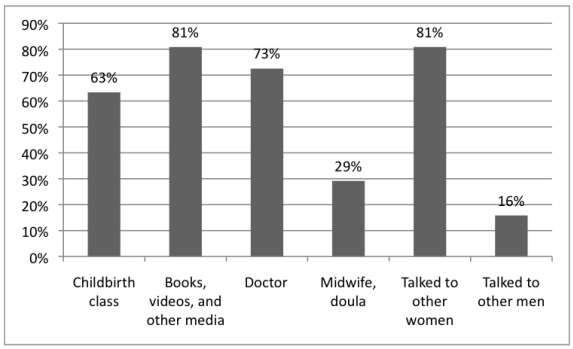

Figure 3. Preparation methods for labor and childbirth

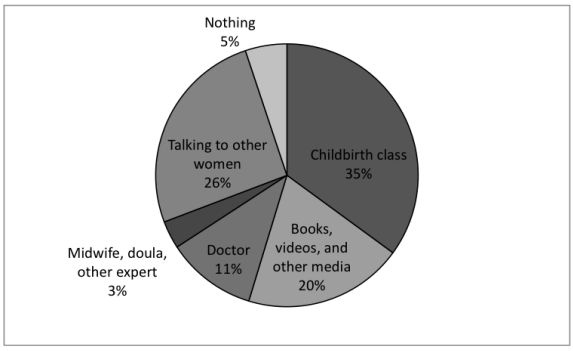

Figure 4. Preparation methods: What was most useful?

Talking to men whose partner had given birth was not popular (16%) and participants are unlikely to prepare by talking to other men again (8%). Not one participant thought this was the most useful method of preparation, and only 5% of participants would recommend talking to men, presumably birth partners, to prepare for birth. However, as we will see in a later analysis, talking to men had a positive effect on satisfaction with physical support and natural pain relief in labor.

Figures 3, 4, 5 and 6 summarize these findings.

There was a relationship between preparing by childbirth class with the first child, and choosing to prepare by childbirth class again ($p = 0.006$). There was no similar relationship, however, for any other preparation method.

Support in childbirth

We asked participants who participated in supporting the mother during childbirth. All answers were signifi-

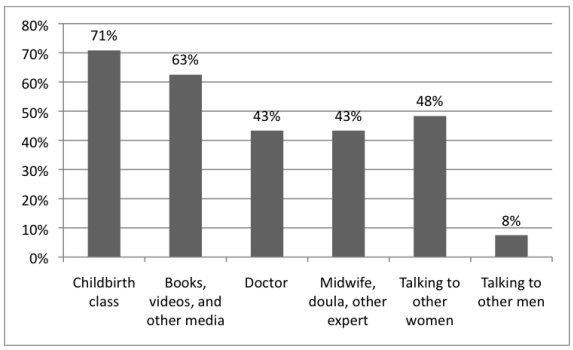

Figure 5. Preparation methods: What would you do again?

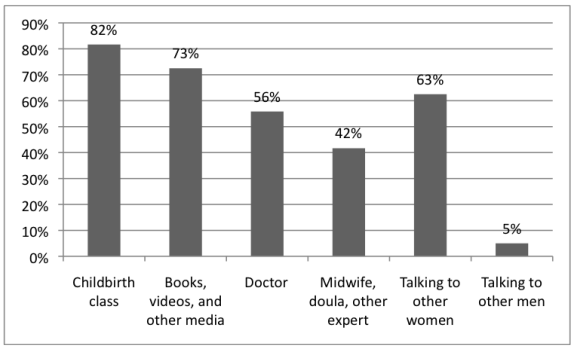

Figure 6. Preparation methods: What would you recommend to a friend?

cant ($p < 0.001$, one-sample binomial test). The mean number of non-medical personnel present to offer support to the mother was 1.50 ($p < 0.001$, one-sample Kolmogorov-Smirnov test). Most (92%) participants had (or provided) some continuous support during labor.

Most participants (78%) had spousal support during labor and childbirth; some (28%) had parents supporting them. Still fewer were accompanied by a sister or brother (15%), a friend (13%), and/or a midwife (10%). Nine participants (8%) reported having no continuous labor support, aside from the intermittent hospital staff visits from doctors and nurses. Unfortunately, despite the influential research (Van Zandt, Edwards, & Jordan, 2005; Klaus, Kennell, & Klaus, 1993, 2002), only one participant reported having a doula, or professional childbirth assistant, present at the birth (less than 1%).

We found a significant relationship between the total number of support persons with the participant during labor and childbirth and the total number of different ways the participant prepared for the birth ($p < 0.001$). The more different ways participants prepared for their birth, the more people were present for continuous support during the birth. Participants that had spousal support prepared by reading books ($p = 0.001$), taking childbirth class ($p = 0.001$), and talking to their doctor ($p = 0.001$).

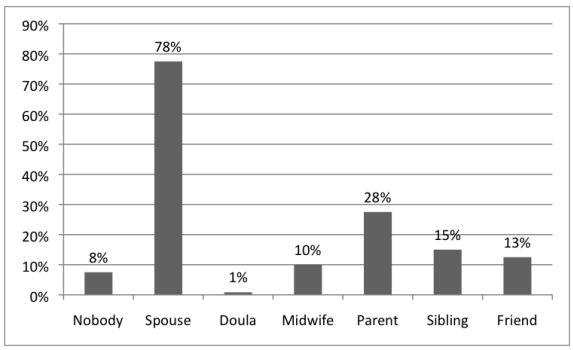

Figure 7. Support during labor: Who was there for continuous labor support?

As a couple, the woman and her partner were likely to prepare for childbirth together. Participants that had nobody with them during labor and childbirth for support were likely to prepare for childbirth by reading books ($p < 0.001$); however, there was a negative correlation between having no support person present during the birth and the number of books read.

Pain relief in labor

The majority (62%) of participants reported using pharmacological methods of pain relief, such as morphine, demerol, narcotics, or epidural analgesia during the birth of their first child. Only 22% reported using a non-pharmacological techniques, such as water therapy, aromatherapy, massage, acupuncture, a TENS machine, or another natural method. Further correlations are discussed below.

Satisfaction with support in childbirth

DONA International, an organization of birth and postpartum doulas, defines the role of a birth doula as a woman that provides "continuous physical, emotional and informational support to the mother before, during and just after childbirth." We asked participants to rate satisfaction with the different support components during labor, which we defined as emotional support, physical support (e.g., helping the mother move around), cognitive support (i.e., presence and company), and informational support (e.g., telling the mother what is happening). We also asked participants to score their satisfaction with pharmacological pain relief and non-pharmacological, or natural, pain relief. We used a four-point Likert-like scale (very unsatisfied, unsatisfied, satisfied, very satisfied). The findings are statistically significant ($p < 0.001$, one-sample chi-square test) and are summarized in Figure 8. C IUJHN./,NåTZ M

Emotional. 80% of participants replied they were satisfied with the emotional support received, compared to

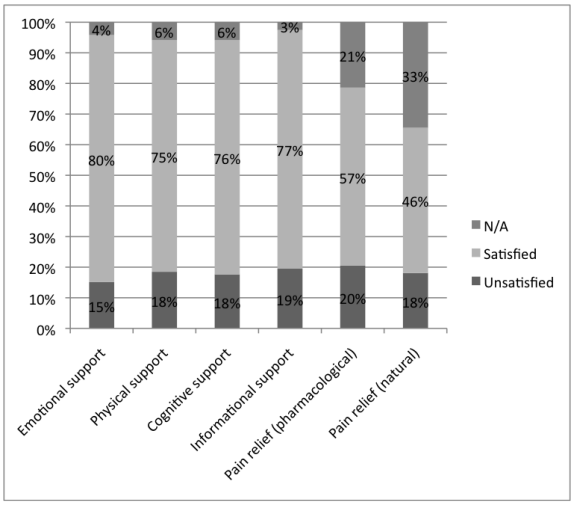

Figure 8. Satisfaction with support in labor

15% of participants unsatisfied.

Physical. For physical support (e.g., helping the woman in labor move around) 75% were satisfied with the support received; 18% were unsatisfied.

Cognitive. We define cognitive, or mental, support as presence and company. 76% of participants reported being satisfied with the cognitive support they received in labor, and 18% were unsatisfied with it.

Informational. Informational support, being told what was happening during the stages of labor and during childbirth, was found to be satisfactory by 77% of participants, and unsatisfactory by 19%.

Pain relief options. Most (57%) of the participants were satisfied by the pharmacological pain relief (e.g., narcotics or epidural); however, 20% were unsatisfied with it (and 21% answered that this question did not apply to them). Finally, natural, non-pharmacological pain relief was found to be satisfactory by 46% of participants, and unsatisfactory by 18% (and 33% answered that this question did not apply to them).

Total. Analysis with chi-square showed a significant relationship between the total number of people supporting the mother and the satisfaction rating with respect to emotional support ($p < 0.05$), physical support ($p < 0.05$), and cognitive support ($p < 0.05$). The total number of people was also related to the total number of ways the participants prepared for labor and childbirth ($p < 0.01$).

Learning in labor

Is "just doing it" the best preparation for labor and childbirth? Five percent of participants said there is no best, most useful preparation: "Nothing really prepares you for childbirth except doing it; then you are prepared for the next one." To investigate this phenomenon, we asked participants to rate, on a four-point Likert-like scale, their feelings about their knowledge level before the birth and after the birth of their first child.

First, we asked: "How much did you know about the labor and childbirth process *before* your or your partner's first birth?" The options were nothing, a little / I had studied it a long time ago, some / I had studied it recently, and people sought my advice on this. Then, we asked: "How much did you know about the labor and childbirth process *after* your or your partner's first birth?" The options were nothing, a little / as if I had studied it a long time ago, some / as if I had studied it recently, and people seek my advice on this.

We found that the rating of what participants felt they knew before the labor increased dramatically after the labor. Significance was measured with Wilcoxon Signed Ranks Test, and $p < 0.001$ for all of the following items.

Before the labor, participants' answers were largely split. About half of the participants replied that they knew "some" or a significant amount about the topic. That is, they replied "Some / I had studied it recently" or "people sought my advice on this." These statements were chosen for their concrete, direct interpretations. The other half of participants answered that they knew a little or nothing about the topic, marking "A little / I had studied it a long time ago" or "Nothing" on the survey form.

After the labor, the answers very highly polarized. The majority of participants answered that they had a good or excellent understanding of all items. In particular, very few participants (11% or less) responded that they still knew "nothing" about an aspect of labor and childbirth after the birth.

The statistical breakdown is described below.

Labor process (stages of labor, etc.). Participants' responses were an average of 27% higher for the post-birth question than the pre-birth question. After the birth, only 6% of participants replied that they knew only a little or nothing about the labor process. The mode of birth was not a factor — there was no difference between participants that delivered vaginally and participants that delivered by Caesarean section. Figure 9 shows the distribution of answers.

Comfort techniques. The mean rating for comfort techniques was 19% higher in the post-birth question. However, 20% of participants marked that they still knew a little or nothing about comfort techniques. One possible reason that 20% of participants knew a little or noth-

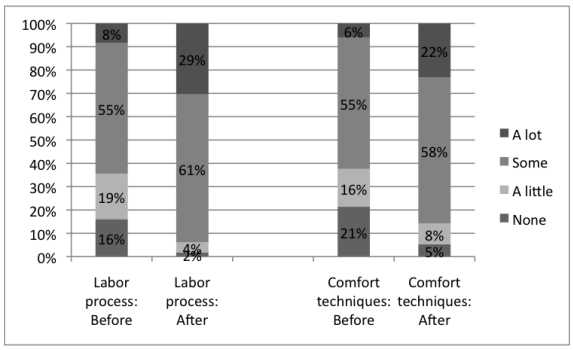

Figure 9. Before and after: How much did you know about the labor process and comfort techniques?

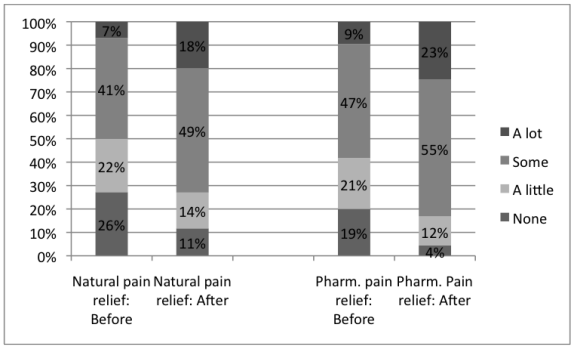

Figure 10. Before and after: How much did you know about pain relief options?

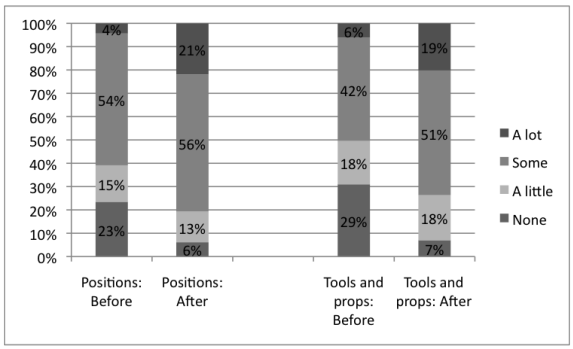

Figure 11. Before and after: How much did you know about labor and birth positions and the tools and props for helping laboring women?

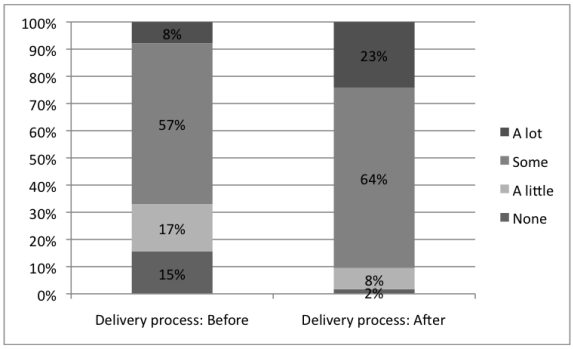

Figure 12. Before and after: How much did you know about the delivery process?

ing about natural comfort techniques and pain relief options is because of the high first-time Caesarean section rate. There was no correlation between knowledge about comfort techniques and pain relief method or mode of birth (see Figure 9).

Non-pharmacological pain relief options. Knowledge about non-pharmacological, or natural, pain relief options before the birth was split: nearly half knew "some" or more. After the birth, the number increased by 19%. Unfortunately, a quarter (25%) of participants still knew a little or nothing about natural pain relief, despite having delivered a baby. As with comfort techniques, one possible reason so few mothers and their partners knew about natural pain relief options is because 20% of these mothers delivered via Caesarean section. Figure 10 shows a summary of this finding.

Pharmacological pain relief options. Twenty-two percent more participants responded that they knew "some" or a significant amount about pharmacological pain relief options after their birth experience than before. However, 16% said they knew a little or nothing (see Figure 10). Because 38% of participants did *not* use pharmacological pain relief in labor, this number is not surprising.

Labor and birth positions. Participants' ratings of their knowledge of labor and birth positions rose by 19% in the post-birth question compared to the pre-birth question. Figure 11 summarizes the participants' answers.

Tools and props for helping laboring women. Although participants' responses were evenly split before the birth, after the birth, participants' scores for their knowledge of tools and props for helping laboring women rose by 22%. Figure 11 shows a summary graph.

Delivery process. Twenty-two percent more participants answered that they knew "some" or a significant amount about the delivery process after their birth experience. See Figure 12.

Postpartum. Responses about the early postpartum period on the pre-birth question were split: half of participants said they knew "some" or a significant amount; half said they knew a little or nothing. On the post-birth question, 32% more participants said they knew "some" or a significant amount. Figure 13 shows a summary of these answers.

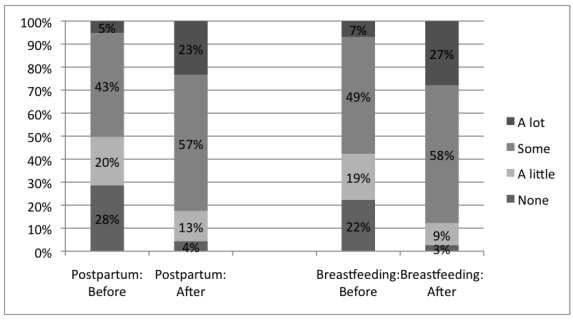

Figure 13. Before and after: How much did you know about the early postpartum period?

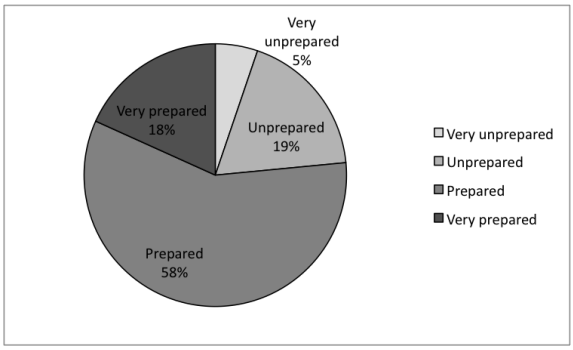

Figure 14. Did you feel prepared for labor and childbirth?

Breastfeeding. Breastfeeding knowledge ratings increased an average of 29% on the post-birth question, relative to the pre-birth question. Interestingly, only 9% of participants said they knew a little, and only 3% of participants said they knew nothing about breastfeeding after giving birth. We will discuss this in more detail below. Figure 13 displays the difference in answers before and after the birth.

Prepared and ready

We asked participants if they had felt prepared for labor and childbirth. Answers were provided on a four-point Likert-like scale (very unprepared, unprepared, prepared, very prepared). In retrospect, most (76%) participants felt some degree of preparation: feeling very prepared (18%) or prepared (58%). The remaining quarter of the participants (24%) felt very unprepared (5%) or unprepared (19%). See Figure 14 for a visual representation of this data.

Correlations

Spearman's rho bivariate correlation was used to test non-parametric values. For each correlation table, we note significances at the 0.01 level (2-tailed) with two asterisks (**). Significant correlations at the 0.05 level (2-tailed) are noted with a single asterisk (*).

	Instrumental birth	Used non-pharm.
Talking to men	—	.272**
Taking classes	—	.194*
Talking to doctor	.220*	—
Talking to professional	—	.421**
Number of books read	—	.251**

Table 1
Childbirth preparation method versus instrumental birth and whether non-pharmacological methods of pain relief were used in labor

	Supported by...	
	Spouse	Nobody
Taking classes	.308**	−.204*
Reading books	.335**	−.394**
Talking to doctor	.311**	—
Number of books	.316**	−.302**

Table 2
Preparation method and support in labor

Preparation methods and labor outcome. We compared the preparation methods participants used and the outcome of the childbirth.

Participants that prepared by taking childbirth classes, talking to other men, and talking to professionals (e.g., midwife, doula) were more likely to use non-pharmacological methods of pain management during labor. Using natural techniques was also correlated with the number of books the participants read in preparation.

We found that participants that prepared by talking with a doctor (73% of participants said they did this) were also likely to have an instrumental birth (i.e., by forceps or vacuum extraction). These results are summarized in Table 1.

Support in labor and preparation methods. Participants that reported being supported by their spouse were more likely to prepare by taking classes, reading books, and talking to their doctor. However, participants that had no support were unlikely to take classes and read books (see Table 2).

Support in labor and pain relief. Next, we examined support in labor and pain relief options used in labor. Table 3 shows a strong correlation between spousal support and pharmacological methods of pain relief. No such correlation was found for any other support person, including no support. Figure 15 shows that participants supported by a spouse were five times more likely to use pharmacological methods of pain relief than participants without a spouse present (10% vs 50% — see Figure 15).

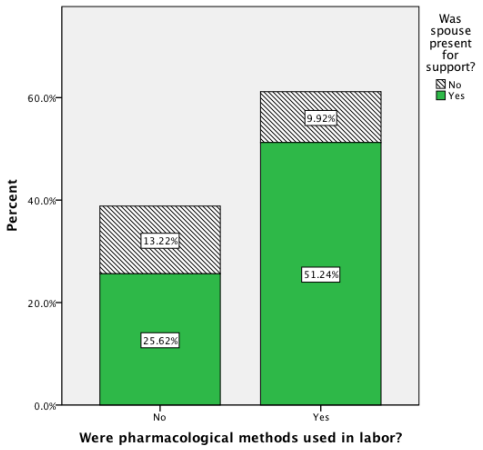

Figure 15. Pharmacological methods of pain relief and whether a spouse was present during labor

	Used non-pharm.	Used pharm.
Spouse support	—	.206*
Midwife support	.365**	−.303**

Table 3
Support in labor and whether pharmacological or non-pharmacological methods were used

We also found that participants supported by a midwife were both less likely to use pharmacological methods of pain relief and more likely to use natural pain relief options. Again, no such correlation was found for any other support person.

Satisfaction. Participants that rated highly their satisfaction with any of emotional, physical, cognitive, and informational supportduring the birth of their first child were likely to rate all of these aspects highly (correlation coefficients all greater than 0.670, $p < 0.01$, two-tailed).

This strong correlation between emotional, physical, cognitive, and informational support indicates the appropriateness of these metrics. A birth experience has emotional, physical, cognitive, and informational components. A person with a positive birth experience is likely to measure all of these support metrics highly; one that has a negative experience is likely to feel unsupported in all of these ways.

Satisfaction with pharmacological support was also correlated positively with all of the other aspects of labor (correlation coefficients greater than .240, $p < 0.01$, two-tailed). Satisfaction with non-pharmacological support was an exception: it was correlated only with satisfaction with emotional support (correlation coefficient 0.233, $p < 0.05$), and informational support (correlation coefficient 0.231, $p < 0.05$).

There was no correlation between the mode of birth (vaginal or Caesarean section) and satisfaction with the level of support.

	Satisfaction with...		
	Emotional	Physical	Cognitive
No. persons	.349**	.278**	.295**
No. of methods	.342**	.358**	.292**

Table 4
Correlation between number of support persons present, the number of preparation methods used, and the satisfaction rating with emotional, physical, and cognitive support in labor

	Satisfaction with...		
	Emotional	Physical	Cognitive
Nobody	−.219*	−.227*	−.211*
Friend	—	.192*	.198

Table 5
Correlation between no support person or having a friend as a support person and satisfaction with emotional, physical, and cognitive support in labor

Satisfaction with support and support person. We found that both the total number of people supporting the mother during labor and childbirth — spouse, sister, mother, etc. — and the total number of methods used to prepare for childbirth were positively correlated to emotional, physical, and cognitive support satisfaction (see Table 4).

Table 5 shows that we found participants that had no support person(s) with them during their labor were unhappy with the level of emotional, physical, and cognitive support. Although unsurprising, this finding corroborates existing research about the importance of continuous support for a woman throughout her labor and birth. Further, participants with a friend supporting them in labor were more likely to be satisfied with emotional, physical, and cognitive support.

Satisfaction and preparation methods. We compared participants' satisfaction with the support types in labor with the methods of labor preparation.

We found that preparing by talking to a professional (e.g., midwife, doula) was positively correlated with satisfaction across all types of labor support. Satisfaction scores were 25% to 52% higher for each category when participants prepared with a professional (see Table 6).

Talking to a doctor was positively correlated with satisfaction with all but non-pharmacological support. Doctors rarely prepare their patients by discussing natural pain relief options, as a doctor's specialty is with pharmacological methods of relieving pain.

Reading books, one of the most popular methods of preparation (81% of participants marked this option),

	Overall satisfaction, %		
	No midwife	Midwife	Δ
Emotional support	57	82	25
Physical support	47	79	32
Cognitive support	48	82	34
Informational support	43	94	52
Pharm. pain rel.	25	65	39
Non-pharm. pain rel.	16	59	43

Table 6
Higher scores in all areas when participants prepared by talking to a childbirth professional (non-medical doctor)

was positively correlated with satisfaction with emotional, physical, and informational support in labor. me." Another participant wrote: "Class [was most useful to me], because we took it together." However, our results suggest that there was no correlation between taking a childbirth class and feeling supported on a cognitive level through presence and company. Preparing by taking classes was positively correlated only with satisfaction with emotional support and pharmacological pain relief support. That is, participants felt supported emotionally, and were satisfied with the medications they were given (if they chose to use them) to manage labor pain.

Talking to women, the other most popular method of preparation for childbirth (chosen by 81% of participants), was correlated only with satisfaction with cognitive support — that is, the sense of presence and company. However, participants found talking to women to be critical in preparing for childbirth, as one-quarter (26%) of participants cited talking to other women as the single most useful method of preparing for childbirth. One participant explained: "Talking to other mothers [was the most useful method of preparation]. They've been through it and were the most honest about what to expect."

Participants that prepared by talking to other men who had had children, and were presumably in a role of birth partners, were in the minority (only 16% of participants said they prepared by this method, even though they were not restricted in the number of preparation methods they could choose). However, those that prepared by talking to other men were likely to be satisfied with physical support and non-pharmacological methods of pain relief. One possible reason is that men had become mini-experts: by attending another birth, they had learned how to support a woman in labor. They knew how to provide physical support, such as helping her walk, lifting her, massaging her, and helping her get into and out of bed. These methods are also useful as non-pharmacological ways to relieve the pain and discomfort associated with childbirth. Table 7 contains the correlation coefficients for these figures.

	Satisfaction with...		
	Emot.	Phys.	Cog.
Talking to women	—	—	.184*
Talking to men	—	.204*	—
Taking classes	.214*	—	—
Reading books	.276**	.258**	—
No. of books	.287**	.223*	.219*
Talking to doctor	.236**	.291**	.192*
Talking to pro.	.305**	.268**	.282**

	Satisfaction with...		
	Info.	Pharm.	Non-pharm.
Talking to men	—	—	.310**
Taking classes	—	.214*	—
Reading books	.238**	—	—
Talking to doctor	.357**	.184*	—
Talking to pro.	.355**	.188*	.277**

Table 7
Preparation methods and satisfaction with support in labor

	Feelings of preparedness
Midwife support	.204*
Friend support	.196*
Used non-pharm.	.211*
Childbirth class	.271**

Table 8
Feelings of preparedness and midwife support, friend support, preparation by childbirth class, and whether non-pharmacological methods were used in labor

Feelings of preparedness and support. Participants that had a midwife or a friend present for support were more likely to respond that they felt prepared for the birth of their first child. No other such correlations were found for any other support person. Participants that used non-pharmacological methods of pain relief were more likely to say they had felt prepared. Feelings of preparedness were positively correlated with attending childbirth class. Table 8 summarizes these findings.

Discussion

In this study, we asked participants to recall their first birth experience. The most common birth year was 1988, and the average was 1990 — most births occurred 22 to 24 years prior to taking this survey. We argue that the memory of the birth does not fade with time. Githens, et al., have found that mothers can remember the details of their births for four to six years (Githens, Glass, Sloan, & Entman, 1993); Tomeo and others saw that this memory can extend for 30 years after the birth of their child: mothers can recall details of their pregnancies and birth weights of their infants 30 years after the birth of their

child (Tomeo et al., 1999). Simkin found that women can recall particular details about their birth experience even 20 years later (Simkin, 1992). Because childbirth is a very significant event, we consider the retrospective survey approach a valid way to assess satisfaction with labor support, knowledge, and feelings of preparedness.

Participants were unlikely to prepare for childbirth using just one method. A combination of methods — childbirth class, talking to men, talking to women, and reading a number of books — were positively correlated.

Most (63%) of participants attended organized childbirth preparation classes. This is higher than the Listening to Mothers survey (56% of first-time mothers) (Declercq et al., 2007).

Participants with no labor support were unlikely to prepare for labor and childbirth by other methods, such as taking classes and reading books about childbirth. They were also likely to have a negative birth experience, with poor emotional, physical, and cognitive support in labor.

Those supported by a spouse were five times more likely to choose and use pharmacological methods of pain relief than those without a spouse present. One possible reason for this phenomenon is that, typically, spouses are not trained childbirth support persons. New fathers in particular experience anxiety during their partner's labor because of their own emotional involvement both in the mother's birth process and in the birth of the child (Klaus et al., 1993). Backström, et al., studied the needs of fathers as birth partners, and found that fathers need good support in the same ways that mothers need: informational support (being allowed to ask questions), physical support (being allowed to step back or become more involved), and emotional support (feeling engaged rather than left out) (Bäckström & Wahn, 2009). Finally, Hallgren, et al., point out that birth partners need special preparation for birth, and suggest that birth partners are given separate, different education than new mothers (Hallgren, Kilhgren, Forslin, & Norberg, 1999); Vehviläinen-Julkunen and Liukkonen's Finnish study found that fathers felt uncomfortable throughout the mothers' labor. Moreover, the most difficult part of labor for fathers was seeing the mothers experiencing the pain of labor, and feeling unable to help (Vehviläinen-Julkunen & Liukkonen, 1998). In maternity wards in which epidural analgesia and other pharmacological methods of pain relief are commonplace, it is not surprising that, when presented with a spouse experiencing pain, the father wishes to help, thereby finding the easiest and swiftest course of action: advocating for pharmacological pain relief.

The overwhelmingly best way to prepare for having a child is to have a child. Going through the experience of childbirth is the best way to learn about the subject: participants replied that they knew significantly more about every aspect of childbirth after the fact. Breastfeeding was no exception: The Listening to Mothers survey (Declercq et al., 2007) cites that 61% of the women surveyed intended to breastfeed their babies as they neared the end of their first pregnancy. The majority (72%) fed their babies either breast milk exclusively, or a combination of formula and breast milk, at a week postpartum and nearly a third (27%) fed their babies no breast milk. Our finding suggests that, after birth, mothers and their partners possess the knowledge to breastfeed: 85% knew "some," or self-identified as experts in breastfeeding, whereas only 12% said they knew a little or nothing about the subject. This accounts for some of the mothers in the Listening to Mothers survey, but not the remaining 15%. In other words, a lack of knowledge on the topic of breastfeeding is not the reason mothers choose not to breastfeed their infants. Mothers and their partners possess all of the necessary information about breastfeeding.

The methods of preparing for childbirth have an effect later, with parents' satisfaction with the labor process. The most popular methods of preparing for childbirth were talking to other women and reading books, watching movies, and browsing the Internet for information. The former was not shown to have a positive correlation with any aspect of the labor and childbirth process other than cognitive support. Talking with other women may contribute to feelings of kinship — feeling a part of a larger whole; feeling connected to all women that have undergone the experience of childbirth (Davis-Floyd, 2003) — and make them feel supported on a mental level by the thought of these women. Participants that prepared with books and other media showed higher scores for emotional, physical, and informational support satisfaction in the birth process. The number of books participants read in preparation for labor was correlated not only with informational satisfaction (that is, how much information the participants received in labor), but also with emotional, physical, and cognitive satisfaction. This indicates that the number of books does not contribute to information alone. Mothers and their partners are preparing on a deeper level with each new book read. They are more likely to imagine a great number of birth outcomes, and prepare both mentally and emotionally for different possibilities. However, because those that prepared with books also prepared with other methods, including talking to other women, taking childbirth classes, and talking to their doctor, and because these same participants were likely to be supported in labor and childbirth by their spouse, it is difficult to draw a conclusion.

Participants that prepared by talking to midwives were particularly satisfied with all aspects of their birth experience, and used more non-pharmacological, natural comfort techniques during labor. The Citizens for Midwifery define the Midwives Model of Care[1] as follows.

[1] Citizens for Midwifery. `http://cfmidwifery.org/mmoc/define.aspx`. Retrieved September 13, 2010.

• Monitoring the physical, psychological, and social well-being of the mother throughout the childbearing cycle

• Providing the mother with individualized education, counseling, and prenatal care, continuous hands-on assistance during labor and delivery, and postpartum support

• Minimizing technological interventions

• Identifying and referring women who require obstetrical attention

Providing continuous hands-on assistance, in particular, is in direct opposition to the technocratic model of birth (Davis-Floyd, 1994, 2003) that medical doctors tend to practice (Block, 2007), and hence midwives may provide more continuous, mother-centric care.

Conclusion

Although "just doing it" is the best preparation for childbirth — that is, having a child is the best way to learn about childbirth and prepare for a subsequent birth — parents should have access to preparation methods for their first birth experiences. The most popular method of preparation is talking with other women who had given birth; however, it is an unstructured and anecdotal method. Other most common ways of preparing for a first child are talking to other women; reading books, watching videos, and browsing Internet sites for information; and talking to one's doctor. Although taking childbirth classes is the fourth most popular method of preparation, it is seen as the most useful and is most likely to be recommended to friends. Hence, childbirth education and preparation classes are a good medium for implementing the following suggestions to better the preparation and support women receive.

From our survey, it is apparent that the following points need to be taken into consideration when preparing for childbirth.

• Use a midwife. In the United States, midwives are used by only about a tenth of women. Parents that prepare by talking to a midwife are less likely to choose pharmacological methods of pain relief, are more likely to use natural comfort techniques, and are overall more satisfied with the support received during labor and childbirth. More parents should choose to examine midwifery care, and prepare for upcoming births by it discussing with a midwife. Childbirth education classes should encourage midwifery for uncomplicated, low-risk pregnancies.

• Provide support. No woman should be left alone in labor. There is an association between parents that do not prepare for labor, the number of labor support persons, and the parents' ultimate satisfaction with their support in birth. Childbirth education classes should encourage participants to talk about pregnancy and childbirth, to invite their friends without children to classes, and to use a doula.

• Prepare the partner. The five-fold increase of women that choose pharmacological methods of pain relief if their partners are present at their labor indicates that partners need more preparation. Although childbirth education classes are popular, effective, and enjoyed by the majority of first-time parents, it is clearly insufficient preparation. More attention should be paid to partner education, including possibly separate training for partners, to prepare them for the possible emotional implications of seeing the mothers experience discomfort and pain associated with childbirth.

• Investigate breastfeeding. New parents are sufficiently prepared for breastfeeding, but many choose not to breastfeed for other reasons than education. The hidden reasons should be investigated.

References

Althabe, F., & Belizán, J. (2006, July). Caesarean section: the paradox. *The Lancet*, *368*(9546), 1472 - 1473.

Bäckström, C., & Wahn, E. H. (2009, July). Support during labour: first-time fathers' descriptions of requested and received support during the birth of their child. *Midwifery*, *Epub ahead of print*.

Belizán, J., Althabe, F., & Cafferata, M. (2007). Health consequences of the increasing caesarean section rates. *Epidemiology*, *18*, 485-486.

Block, J. (2007). *Pushed: The painful truth about childbirth and modern maternity care*. Da Capo Press.

Davis-Floyd, R. (1994). The technocratic body: American childbirth as cultural expression. *Social Science & Medicine*, *38*(8), 1125–1140.

Davis-Floyd, R. (2003). *Birth as an American rite of passage*. Univ of California Pr.

Declercq, E., Sakala, C., Corry, M., & Applebaum, S. (2007). Listening to mothers II: Report of the second national US survey of women's childbearing experiences. *Journal of Perinatal Education*, *16*(4), 9–14.

Fabian, H., Rådestad, I., & Waldenström, U. (2005). Childbirth and parenthood education classes in Sweden. Women's opinion and possible outcomes. *Acta obstetricia et gynecologica Scandinavica*, *84*(5), 436–443.

Githens, P., Glass, C., Sloan, F., & Entman, S. (1993). Maternal recall and medical records: an examination of events during pregnancy, childbirth, and early infancy. *Birth*, *20*(3), 136–141.

Goodman, P., Mackey, M., & Tavakoli, A. (2004). Factors related to childbirth satisfaction. *Journal of Advanced Nursing*, *46*(2), 212–219.

Hallgren, A., Kilhgren, M., Forslin, L., & Norberg, A. (1999, March). Swedish fathers' involvement in and experiences of childbirth preparation and childbirth. *Midwifery*, *15*(1), 6-15.

Handfield, B., Turnbull, S., et al. (2006). What do obstetricians think about media influences on their patients? *Australian and New Zealand Journal of Obstetrics and Gynaecology*, *46*(5), 379–383.

Klaus, M., Kennell, J., & Klaus, P. (1993). *Mothering the*

Mother: How a Doula Can Help You Have a Shorter, Easier, and Faster Birth. Perseus Books, New York, USA.

Klaus, M., Kennell, J., & Klaus, P. (2002). *The Doula Book*. Da Capo Press.

Lumley, J., & Brown, S. (1993). Attenders and nonattenders at childbirth education classes in Australia: how do they and their births differ? *Birth*, *20*(3), 123–30.

Morgan, B., Bulpitt, C., Clifton, P., & Lewis, P. (1982). Analgesia and satisfaction in childbirth (the Queen Charlotte's 1000 mother survey). *The Lancet*, *320*(8302), 808–810.

Nichols, M. (1995). Adjustment to new parenthood: Attenders versus nonattenders at prenatal education classes. *Birth*, *22*(1), 21–26.

Simkin, P. (1992). Just another day in a woman's life? part II: Nature and consistency of women's long-term memories of their first birth experiences. *Birth*, *19*(2), 64-81.

Tomeo, C., Rich-Edwards, J., Michels, K., Berkey, C., Hunter, D., Frazier, A., et al. (1999). Reproducibility and validity of maternal recall of pregnancy-related events. *Epidemiology*, *10*(6), 774–777.

Van Zandt, S., Edwards, L., & Jordan, E. (2005). Lower epidural anesthesia use associated with labor support by student nurse doulas: Implications for intrapartal nursing practice. *Complementary Therapies in Clinical Practice*, *11*(3), 153–160.

Vehviläinen-Julkunen, K., & Liukkonen, A. (1998, March). Fathers' experiences of childbirth. *Midwifery*, *14*(1), 10-17.