

Exploring the Presence of Comfort within the Context of Childbirth

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Key points

- Comfort is common, and is commonly sought by us all: comfort is a desirable outcome of midwifery care
- Comfort is most often described in relation to experiences that deprive of us of comfort
- Comfort is a bi-dimensional concept and consists within technical senses (ease, relief and transcendence) and contexts (physical, social, psychospiritual and environmental)
- Comfort can be a strengthening experience.

Introduction

I chose to study comfort during labour because it seemed to me that much of what midwives do for birthing women is to provide comfort (KS). We assist women and support them during labour, and encourage them to use techniques that are comforting. In the United States, labour is defined within a biomedical context, and much of the care during labour is typically provided within this context. Obstetricians' education rightly focuses on how to treat pain and disease so it should come as no surprise that treating the pain of labour is common. Appreciating use of comfort measures and providing comfort during labour is undervalued in some health systems, except by health care practitioners, such as midwives, who commonly use non-pharmacologic methods to support women during labour; methods that comfort women during a very intense and painful experience.

Kathryn Kolcaba developed her theory of comfort within a framework of health. Her studies focused initially on comfort and the terminally ill, but the theory is applicable to any type of health care situation or context. In fact, more recently, comfort theory was used as a unifying framework to enhance the practice environment (Kolcaba, *et al.*, 2006) and was modified and used to direct patient care and the work of health care providers (March and McCormack, 2009). In the latter instance, the potential to facilitate greater understanding amongst disciplines and greater continuity of care for patients was realised. Dr Kolcaba assisted me in developing a Childbirth Comfort Questionnaire (CCQ), which is based on her original theory and the General Comfort Questionnaire. For further information on the theory and framework, suggestions for research and methodology for adapting the General Comfort Questionnaire for use in research, see Kolcaba (2010).

Comfort theory provided a framework that enables viewing labour and childbirth through a holistic lens; a lens that midwives use when providing care for women during labour. When care is committed to providing comfort, needs for relief, ease and/or transcendence are identified, and interventions to meet these needs can then be developed and implemented (Kolcaba and Dimarco, 2005). Comfort theory is health oriented, thus supporting the concept of normal birth. This chapter provides an overview of research undertaken by Schuiling (2003), which used comfort theory in a group of normally labouring, primiparous women. Some women were attended by midwives, others by physicians, and all received care from registered nurses. The focus of the project was to determine whether the phenomenon of comfort did actually exist during labour, and whether women could identify it as such. If comfort did exist, the next step was to explore its relationship to pain. Although the study is small ($n = 64$ participants, of which 53 women completed all phases of the project), it reveals new knowledge and supports the need for further studies of comfort during childbirth.

The research project

Introduction

Comfort, a holistic phenomenon and basic human need, is welcomed by most individuals because it brings about desired sensations of ease and/or relief (Schuiling and Sampselle, 1999). Seeking comfort is normal for both healthy and ill individuals. In fact, seeking comfort is one of the more common reasons people obtain health care. The concept of comfort during labour however, is a paradox to some. Interestingly though, narratives of birthing women suggest they experience sensations of both pain and comfort (Helser, 1998; Lundgren and Dahlberg, 1998) during the birthing process and that, even though the two sensations are very different, one gives meaning to the other. Additionally, those who care for birthing women would probably agree that providing comfort is an important aspect of care. Research about processes of care during labour suggests that when comforting measures are used and comfort

is experienced, that comfort may be a strengthening factor during labour and may enable women to use less analgesia (Simkin, 1995).

Alleviation of pain is identified as a means of providing comfort and support to women in labour (Hodnett, 1996). Weber (1996) identifies the recognition and treatment of pain and discomfort as critical elements in the care of maternity clients. Pain adversely affects comfort, and few would argue that childbirth is not painful. However, birthing women have identified that relief of pain during labour does not necessarily result in a satisfying birth experience (Hummenick and Bugen, 1981; Green, 1993; Lundgren and Dahlberg, 1998).

Health care in North America is largely provided by practitioners educated within a biomedical model. This model is disease oriented and its goal is to 'cure'. The result is that more than 50 per cent of the two million women giving birth in the US each year receive epidural analgesia (Hawkins, *et al.*, 1999). Epidural analgesia eliminates labour pain for most women, but relieving pain and experiencing comfort address two very different needs of birthing women. Reports link epidurals with a number of adverse effects during labour, and information about additional potential side effects is uncertain (see, for example, Lieberman and O'Donoghue, 2002). Many women prefer to keep drug use to a minimum (Green, 1993) and have indicated that the experience of birthing pain, together with a perception of it as a strengthening event, gave added meaning to transitioning to motherhood (Lundgren and Dahlberg, 1998). These findings contrast sharply with the current epidemic of epidural use observed in the US. The problem addressed by this research is the assumption that pain relief meets the comfort needs of birthing women; that, if we cure the pain of birth, women will then experience comfort during the birthing process.

Marmor and Kroll (2002) explored the patterns of pain management during childbirth in the US, and addressed safe and effective methods that were available to US women. The results of their study emphasize that there is little information about what women in the US prefer, why they do so, or what influences their perception about pain management. Marmor and Kroll make it abundantly clear that US women have considerably less choice about pain control during childbirth than women in many other advanced Western industrialized democracies. The final report of the 'Listening to Mothers Survey' (Declercq, *et al.*, 2002), (the first national US survey of women's childbearing experiences) found that, even though selected comfort (non-pharmacologic) measures were often rated as highly effective by the women using them, they were used less than 8 per cent of the time. Simkin and O'Hara (2002) note further that, despite reports of the effectiveness of comfort methods, they receive little attention in the literature and are not commonly available to women in the US.

A key consideration of labour pain overlooked in the biomedical model is that labour pain is part of a physiologically normal event: childbirth. Pain – in the context of helplessness, suffering, and loss – is different from pain in the context of coping resources, comfort and a sense of accomplishment (Lowe, 2002). Labour pain can be a guide to mothers in labour; it can herald to the mother that her position needs to be changed or that progress is occurring.

Comforting interventions may enable her to interpret the nuances of pain, and provide her with the strength to continue being an active participant in the process. Focusing on comfort during labour does not negate the existence of pain but, instead, may offer birthing women expanded alternatives for pain control.

The purpose of this study was: to explore the existence of comfort during labour in a sample of healthy, primigravid women experiencing a normal labour and birth. The relationship between comfort and pain was examined, and comforting interventions that positively impacted women's level of comfort were identified.

The research questions addressed were:

- Does comfort exist during labour?
 - If comfort exists can it be quantified?
 - Does the level of comfort change during the course of labour?
 - What comfort measures did the women in this study use and did they promote comfort?
 - What is the relationship between childbirth, comfort and pain?

Study framework: Kolcaba's Theory of Holistic Comfort

Kolcaba's (2003) holistic theory of comfort encompasses process (comforting) and product (comfort), and proposes that 'comfort care' is a process of comforting actions stimulated by the individual's and care giver's perception of comfort needs. Comforting can be called such only if the product of comfort is brought into being (Kolcaba, 1995). The basic assumptions of this theory are that:

- human beings have a holistic response to complex stimuli
- comfort is a desirable outcome
- human beings strive to meet, or have met, their basic comfort needs.

Box 9.1 Kolcaba's definition of holistic comfort

Holistic Comfort

Kolcaba defines holistic comfort as the immediate experience of being strengthened by having needs for relief (the experience of having met immediate needs for comfort), ease (state of calm or contentment) and transcendence (state in which one rises above problems or pain) met in four contexts: physical (pertaining to bodily sensations and homeostatic mechanisms that may or may not be related to specific diagnoses), psychospiritual (whatever gives life meaning for an individual and entails self-esteem, self-concept, sexuality and relationship to a higher order or being), environmental (external surroundings, conditions and influences), and sociocultural (interpersonal, family and sociocultural relationships including finances, education, and support, traditions, customs and language)

Source: Kolcaba (2003).

Integral to this theory are health-seeking behaviours (Schlotfeldt, 1975) which are a wide range of subsequent activities that may be voluntary or involuntary, conscious or subconscious (Glazer and Pressler, 1989). Comfort and health-seeking behaviours have a reciprocal relationship, and the immediate outcome of comfort is a whole person response (Kolcaba, 1992).

Comfort during childbirth fits Kolcaba's (1994) theory of comfort because childbirth is a naturally occurring, usually desired, whole-person event. Consistent with the theory, 'comfort' is an umbrella term under which relief of many types of discomfort – for example, pain relief, coping and anxiety management – are subsumed.

Methods

The project consisted of four phases:

- development of the Childbirth Comfort Questionnaire (CCQ)
- assessment of internal validity of the CCQ
- assessment of effect size of comfort and adequacy of sample size
- analysis of data and answering the research questions.

Sample

Participants were selected from three regions of the US Midwest, using non-probability, convenience sampling (Polit and Beck, 2008). Births occurred at three tertiary care hospitals located in the same Midwestern state. Physicians or midwives were the primary birth attendants at each hospital. An important distinction amongst the hospitals was that one uses intrathecal analgesia, rather than epidurals, as a means of managing labour pain.

Recruitment occurred prenatally in clinicians' offices, childbirth education classes and at the time of hospital admission, if the woman was in the latent phase of labour (less than four centimetres dilated). All women at each site who met the inclusion criteria were invited to participate. Inclusion criteria were:

- 18 years of age or older
- able to speak and understand English (or have an interpreter present)
- primigravid
- anticipating a vaginal birth
- presenting in the latent phase of labour
- singleton pregnancy
- uncomplicated prenatal course.

Women who chose to use medication during labour were not excluded from the study because women living in the US commonly use medication for pain relief during labour; thus the sample reflected the general population of child-bearing women. The effect size required to detect changes in comfort during birth was unknown; therefore, initial sample size estimates using Cohen's Table of Power (Cohen, 1992; Polit and Beck, 2008; Walker and Almond, 2010) were computed using a significance level of 0.05 and a power of 0.80.

A sample size of 50 participants was deemed appropriate to detect a moderate effect and to allow statistical correlation analyses. A sample size of at least 50 was set as the goal, to allow for missing data or participants dropping out during the study.

Data collection

Data collectors were nurses and midwives who had experience working with women during birth. All data collectors were trained in data collection procedures. Appropriate Institutional Review Boards at each site approved the study prior to data collection. Data were collected between 2002 and 2003.

Childbirth Comfort Questionnaire

The CCQ, adapted from the General Comfort Questionnaire (Kolcaba, 2010), was used to assess women’s level of comfort during labour. All items of the CCQ scale are interdependent; a change in one produces a change in another (Kolcaba, 1992). The CCQ consists of 14 5-point Likert scaled statements. Each statement addresses a specific sense of comfort (relief, ease, transcendence) and context (physical, environmental, psychospiritual, social). There are an equal number of positive and negative items on the instrument, thereby decreasing the risk of response bias (Figure 9.1).

CCQ items focusing on childbirth were initially derived from labour and delivery nurses, midwives, obstetricians, women who had experienced normal labour and birth, and the extant literature. Face validity was established by a panel of experts that included midwives (n = 5), obstetricians (n = 3

**Data Collectors please read the statement below at each data collection time point
Circle her score.**

Thank-you VERY MUCH for helping in this study about the feelings women experience during labour. I am going to ask you to rate how you feel about 14 statements. Please rate each statement from 1 to 5, with '1' meaning you 'strongly disagree' and '5' meaning you 'strongly agree' at this moment.

Example:

I am glad I am being asked these questions I (strongly disagree) to 5 (strongly agree).

- | | |
|---|-----------|
| 1. I have enough privacy. | 1...2...3 |
| 2. My pain is difficult to endure. | 1...2...3 |
| 3. I feel empowered by those around me. | 1...2...3 |
| 4. I don't think I can do this without the help of others. | 1...2...3 |
| 5. I am working well with my body. | 1...2...3 |
| 6. This chair (bed) makes me hurt. | 1...2...3 |
| 7. I can rise above my pain because it is helping me birth by baby. | 1...2...3 |
| 8. I feel confident I can birth my baby. | 1...2...3 |
| 9. This room makes me feel weak and helpless. | 1...2...3 |
| 10. The pain of the contractions motivates me to be strong. | 1...2...3 |
| 11. This is a safe place to be. | 1...2...3 |
| 12. I feel like giving up. | 1...2...3 |
| 13. I worry I will lose control. | 1...2...3 |
| 14. I need to feel better informed about my progress. | 1...2...3 |

Figure 9.1 Childbirth Comfort Questionnaire

Note: Figure is resized for publication purposes.
Source: Schuiling (2002).

women who had experienced labour and birth ($n = 5$). Internal consistency reliability (Cronbach's alpha) was assessed twice: once 25 data sets were received and coded, and at the conclusion of the study. The Cronbach's alpha at both times was 0.71, which is acceptable for a new instrument (Gillis and Jackson, 2002).

Scoring the CCQ consists of adding the responses (once reverse coding is completed for negatively worded items). Possible scores range from 14–70, provided all items are answered, with higher scores indicating higher comfort levels. When data are normally distributed, the top 25 per cent of scores represent high levels of comfort and the bottom 25 per cent of scores represent low comfort.

Pain numerical rating scale

A numerical rating scale (NRS) was used to assess pain intensity. The NRS ranks pain from 0 (no pain) to 10 (worst pain imaginable). This instrument was the instrument of choice for measuring pain because each of the participating institutions typically used this instrument to assess pain, making the introduction of a second new instrument unnecessary.

Paired pain and comfort scores were obtained twice during labour:

- 1–5 centimetres of cervical dilatation (time = T¹)
- 6–10 centimetres of cervical dilatation (time = T²).

Pain scores were documented prior to comfort scores. In order to keep interference with the birthing process to a minimum, the CCQ was administered between contractions. Scientifically, this was acceptable because studies about pain in labour and associated levels of endorphins indicate women rate their pain levels higher between contractions than during a contraction (Cahil, 1989).

Use of the following comfort measures (non-pharmacologic interventions used to promote comfort, including alternative and complementary methods of pain control) was documented during labour:

- aromatherapy – use of pleasing scents to assist with relaxation and comfort
- freedom of movement – being allowed or encouraged to ambulate, rock, or change position in bed at will, which enables the birthing woman to find a position of comfort
- hydrotherapy – use of water to promote comfort during labour
- imagery – use of visual imagery to promote comfort; may be guided or unguided
- massage – any type of massage of a body part that entails touch by a significant other or care provider with the intent of promoting comfort
- music – any use of music to promote relaxation and comfort
- support – one-to-one continuous support provided by a family member, significant other or care provider.

The types and number of comfort measures used at each data point were documented, as was the use and type of pain medication.

Demographic data were collected from all women in the study.

Data analysis

Demographic data were analyzed using descriptive statistics. Pearson's r was used to analyze the relationship between mean comfort and pain scores at T^1 and T^2 . Mean comfort and pain scores were analyzed using analysis of variance (ANOVA) and covered women who used:

- no pain medication
- pain medication other than an epidural
- only epidural analgesia for pain relief.

Data on independent variables considered 'standard care' were collected, and bivariate analysis was used to test the difference between the means of two independent groups; for example, comfort scores and number of comfort measures. When three or more independent group means were available, an ANOVA was used. Appropriate F statistics and degrees of freedom are reported for all ANOVAs and *post hoc* testing using a Scheffé was done when indicated.

Results

Preliminary analysis of 25 data sets revealed that:

- comfort scores were highly correlated between T^1 and T^2 (Pearson's $r = 0.73$)
- there was no significant change in the comfort scores, as indicated by a paired t -test ($t = -1.2$, $df = 26$, $p = 0.231$).

These findings reflect stability of the data and, therefore, a minimum sample size of 50 was determined likely to be sufficient to allow correlation analyses.

Sixty-four primiparous women, ranging in age from 18 to 40 years, participated in the study. Most were Caucasian, high school or college graduates, married, and employed with an average annual family income of US\$50,000 or more (Table 9.1). A majority of the women planned their pregnancies (59.4 per cent) and most attended childbirth preparation classes (64.1 per cent). Physicians attended the majority of the births (65 per cent), although 38.2 per cent of the women indicated they had a midwife birth attendant (some had both a physician and a midwife birth attendant). Most women were admitted to the labour unit when they were between two cms and three cms dilated. The average length of labour was 19.5 hours, which is within normal limits for primiparous women (Varney, *et al.*, 2003). The majority (71 per cent) received pitocin either to augment or to induce their labour, and 84 per cent had continuous electronic foetal monitoring. Baby outcomes were excellent: 100 per cent of the births were live and full-term, and all of the infants had Apgar scores ranging between 7 and 10 at five minutes.

Scores on the CCQ at T^1 ranged from 33 to 67 ($M = 54.48$), and at T^2 from 32 to 69 ($M = 55.68$). The highest subscale scores at T^1 were observed when women reported a sense of ease occurring in an environmental (4.79/5.00) or

Table 9.1 Demographic characteristics of participants

<i>Characteristic</i>	<i>Number (valid %)</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Range</i>
Age (years)		26.25	± 5.12	18–40
Race				
Euro/Caucasian	58.9 (90.6)			
African Am.	2 (3.1)			
Hispanic/Latino	1 (1.6)			
Native Am.	1 (1.6)			
Asian/Pacific Islander	0			
Middle Eastern	1 (1.6)			
Other	1 (1.6)			
Education (highest level completed)				
Elementary	4 (6.3)			
High School	27 (42.2)			
College	27 (42.2)			
Graduate School	6 (9.4)			
Employment				
Yes	46 (74.2)			
No	16 (25.8)			
Marital Status				
Married	42 (65.6)			
Single	8 (12.5)			
Divorced	0			
Separated	12 (18.8)			
Widowed	0			
Live with S/O	2 (3.1)			
Family Income (U.S. dollars)				
Less than \$10,000	6 (9.5)			
\$10,000–\$19,999	7 (11.1)			
\$20,000–\$29,999	6 (9.5)			
\$30,000–\$39,999	8 (12.7)			
\$40,000–\$49,000	10 (15.9)			
\$50,000 or more	26 (41.3)			

social context (4.78/5.00). The lowest subscale scores at T¹ were observed when women reported a sense of relief occurring in a psychospiritual (1.58/5.00) or physical context (3.29/5.00) (see Table 9.2 and Box 9.1).

At T², highest subscale scores are observed when women reported a sense of ease occurring in an environmental (4.92/5.00) and/or social context (4.74/5.00). However, the sense of transcendence received high scores when experienced within environment (4.58/5.00), social (4.36/5.00), or psychospiritual (4.35/5.00) contexts (see Table 9.2).

Table 9.2 Childbirth comfort questionnaire subscale scores at Time¹ and Time²

	<i>Relief</i>			<i>Ease</i>			<i>Transcendence</i>		
	T ¹	T ²	% Change	T ¹	T ²	% Change	T ¹	T ²	% Change
Physical	3.29	3.09	-7%	3.85	4.19	+8%	3.49*	3.66*	+5%
Psychospiritual	1.58	1.66	+5%	3.82	3.72	-3%	4.34**	4.35**	+1%
Social	4.16	4.30	+3%	4.78	4.74	-1%	4.16	4.36	+5%
Environmental	3.55	3.83	+7%	4.79	4.92	+3%	4.58	4.58	0

Note: *Scores averaged for questions 7 & 10. **Scores averaged for questions 8 & 12.

Table 9.3 Statistical findings of comfort and pain scores at Time¹ and Time²

	<i>Pain T¹</i>	<i>Pain T²</i>	<i>Comfort T¹</i>	<i>Comfort T²</i>
Pain T ¹	1.00			
	$r = .275$			
Pain T ²	$p = .06$	1.00		
	$r = -.283^*$	$r = -.107$		
Comfort T ¹	$p = .03$	$p = .46$	1.00	
	$r = -.047$	$r = -.545^{**}$	$r = .577^{**}$	
Comfort T ²	$p = .74$	$p < .001$	$p < .001$	1.00
Mean Score	4.78	4.13	54.48	55.68
S.D. ±	2.9	3.6	6.63	7.7

* $p \leq 0.05$; ** $p \leq .001$.

The women in this study maintained their level of comfort throughout their labour. Total CCQ scores at T¹ significantly correlated with CCQ scores at T² ($r = 0.577$, $p < .001$) regardless of comfort or pain measures used. A small change in pain scores occurred between T¹ (M=4.78) and T² (M=4.13), but this finding did not reach significance ($r = 0.275$, $p = 0.06$) – see Table 9.3.

Pearson's r revealed that comfort and pain were significantly correlated in a negative direction at T¹ ($r = -0.283$, $p = 0.03$) and at T² ($r = -0.545$, $p < 0.001$) (see Table 9.3). Pain scores at T¹ ranged from 0 to 10, with a mean score of 4.78 (S.D. 2.9 [$n = 62$]). Pain scores at T² again ranged from 0 to 10, with a mean score of 4.13 [S.D. 3.6 [$n = 53$]]. Initially, these results seemed to suggest that, as pain scores rise, comfort scores would fall (or the converse). However, further analysis revealed that this assumption is incorrect. Although pain scores fell in response to epidural analgesia, the total comfort scores remained the same or nearly the same as observed during T¹.

Women receiving epidurals noted an increase in comfort within the physical context, but not necessarily within the other contexts of comfort. Comfort

Table 9.4 Comparison of comfort and pain scores of women who did not use pain medication with women who used any type of pain medication

No Pain Medication (<i>n</i> @ T ¹ = 36; <i>n</i> @ T ² = 10)			Used Pain Medication (<i>n</i> @ T ¹ = 24; <i>n</i> @ T ² = 40)				
Scores	Mean	SD	Mean	SD	<i>t</i>	<i>df</i>	
Comfort T ¹	54.97	7.52	53.71	4.97	.729	60	
Pain T ¹	4.94	2.37	4.54	3.71	.515*	58	
Comfort T ²	55.50	7.65	55.72	7.85	-.08	51	
Pain T ²	5.55	3.32	3.78	3.66	1.39	48	

Note: Comfort scores were not significantly different between T¹ and T². Pain scores are significantly correlated between T¹ and T². **p* < .05.

scores of women who chose not to use pain medication versus those who used any type of pain medication (including epidural analgesia) were not significantly different between groups at either T¹ (*t* = 0.729, *df* = 60, *p* = 0.09) or T² (*t* = 0.081, *df* = 51, *p* = 0.99). However, there was a statistically significant difference in mean pain scores between the two groups at T¹ (*t* = 0.515, *df* = 58, *p* < 0.001), with women using pain medication reporting lower scores although not at T² (*t* = 1.39, *df* = 48, *p* = 0.139) (see Table 9.4).

An ANOVA was computed to assess the differences between the mean comfort and pain scores at T¹ and T² among:

- women who used no pain medication
- women who used pain medication other than an epidural
- women who used epidural analgesia.

The group's mean comfort scores were not significantly different from one another at either T¹ or T² (see Table 9.5). Mean pain scores amongst the three groups varied significantly at T¹ (*F* = 12.92, *df*_{2, 50}, *p* < .001) and at T² (*F* = 13.61, *df* = 2, 40, *p* < 0.001). A Scheffé *post hoc* test revealed that, at both T¹ and T², women using epidural analgesia had significantly lower mean pain scores than women who used medication other than an epidural (see Table 9.5).

Women in this study used an average of two or three comfort measures during their labour; the most common measures were:

- one-to-one continuous support (T¹ *n* = 47; T² *n* = 46)
- freedom of movement (T¹ *n* = 43; T² *n* = 22)
- massage (T¹ *n* = 25; T² *n* = 23).

T-tests on comfort scores between women who used a comfort measure at T¹ and those not using comfort measures at T¹ were not significantly different. However, women who had freedom of movement at T¹ had significantly higher comfort scores at T² (*t* = -3.43, *df* = 51, *p* < 0.001), and women who

Table 9.5 ANOVA summary for effect of medication on pain and comfort scores at Time¹ and Time²

<i>Variable and Source</i>	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Comfort T ¹					
Between groups	2	39.64	19.82	0.519	0.598
Within groups	52	1987.56	38.22		
Comfort T ²					
Between groups	2	183.65	91.82	1.303	0.282
Within groups	43	3029.83	70.46		
Pain T ¹					
Between groups	2	149.71	74.86	12.92*	0.000*
Within groups	50	289.61	5.79		
Pain T ²					
Between groups	2	239.79	119.89	13.606*	0.000*
Within groups	40	352.46	8.81		

* $p \leq .05$.**Table 9.6** Difference in comfort scores at Time² for women using a comfort measure at Time¹

<i>Measure</i>	<i>Used Comfort Measure at T¹</i>			<i>Did Not Use Comfort Measure at T¹</i>			
	<i>Mean Scores</i>	<i>S.D.</i>		<i>Mean Scores</i>	<i>S.D.</i>	<i>t</i>	<i>df</i>
Free Movement	57.76	6.72		50.40	7.83	-3.43**	51
1:1 Support	57.19	7.55		49.91	5.58	-2.98**	51

Note: Only significant findings presented. ** $p \leq .001$.

had one-to-one support at T¹ had significantly higher comfort scores if one-to-one support were also used at T² ($t = -2.98$, $df = 51$, $p = 0.004$) (see Table 9.6). Bivariate analysis of the mean comfort scores of women who used comfort measures at T² and those who did not revealed that women who used massage had significantly higher comfort scores than those who did not use massage ($t = -2.29$, $df = 51$, $p < .05$).

T-tests on mean pain scores of women using comfort measures at T¹ and those who did not revealed that women who had one-to-one support had significantly higher pain scores than women who did not have one-to-one support ($t = -2.05$, $df = 58$, $p = 0.04$). Women who had freedom of movement at T² had significantly higher pain scores at T² ($t = -2.26$, $df = 48$, $p = 0.03$), even though the mean comfort scores of this group were also higher (see Table 9.7).

Table 9.7 Pain score differences between women who used comfort measures and women who did not

<i>T</i> ¹ (<i>n</i> = 60) and <i>T</i> ² (<i>n</i> = 50)						
<i>Used Comfort Measure T</i> ¹			<i>Did Not Use Comfort Measure T</i> ¹			
<i>Measure</i>	<i>Mean</i>	<i>S.D.</i>	<i>Mean</i>	<i>S.D.</i>	<i>t</i>	<i>df</i>
Massage	5.24	3.27	4.46	2.70	-1.01	58
Hydrotherapy	4.67	2.89	4.83	3.01	.199	58
Music	3.43	2.88	4.96	2.94	1.30	58
Imagery	4.43	3.31	4.83	2.93	.336	58
1:1 Support	5.19	2.95	3.31	2.56	-2.05*	58
Ambulation	4.76	3.04	4.83	2.83	.085	58
<i>Used Comfort Measure T</i> ²			<i>Did Not Use Comfort Measure T</i> ²			
<i>Measure</i>	<i>Mean</i>	<i>S.D.</i>	<i>Mean</i>	<i>S.D.</i>	<i>t</i>	<i>df</i>
Massage	3.70	3.57	4.64	3.66	1.17	48
Hydrotherapy	3.70	3.74	4.31	3.63	.544	48
Music	4.50	3.70	4.00	3.70	.210	48
Imagery	3.43	3.60	4.24	3.67	.547	48
1:1 Support	4.38	3.82	3.00	2.50	-1.03	48
Freedom of movement	5.55	3.36	3.26	3.57	-2.26*	48

* $p < .001$.

Note: Women who had 1:1 support had significantly higher pain scores than women not using 1:1 support at *T*¹. However, women who had 1:1 support at *T*² had significantly higher comfort scores at *T*² ($t = -2.98$, $df = 51$, $p = .004$). Women who had freedom of movement at *T*² had significantly higher pain scores than women who did not have freedom of movement.

Discussion

The findings of this study suggest that women experience comfort as a state of being that is distinct from pain during childbirth, and that relief of pain during labour is not sufficient to ensure that a labouring woman will experience comfort. That is, pain management and the experience of comfort are not synonymous: pain relief does not assure comfort. The higher comfort scores observed at *T*¹ and *T*² occurring when a sense of ease was experienced within an environment or social context supports theories of the importance of the childbirth environment and human presence. Green *et al.* (1990) comment that little attention is paid to a woman's relationship with her care givers, but that this relationship may well have relevance to subsequent psychological states during childbirth. The higher CCQ scores found at these intersects may be women's voices telling us that the birth environment and the relationship

the woman forms with her birth attendant is of considerable importance, particularly in enabling her to feel a sense of comfort.

Mean comfort scores at T¹ positively correlated with those at T²; most women in this study maintained a moderate level of comfort throughout their labour. The lack of significant differences between comfort scores may be due to the healthy population of women participating in this study. It is very likely these women actively sought to maintain their level of comfort. If labour is viewed through a lens that frames the process as normal, then it makes sense that healthy women would actively seek to maintain their comfort. They would ask for a back-rub, or change their position to one of greater comfort, or ask for medication. All of these activities would have been well within the locus of control of the women participating in this study. Additionally, the majority of women in this study had one-to-one support, and women who had one-to-one support had higher comfort levels at T², which may have offset the increasing pain of contractions. However, women who had one-to-one support at T¹ also had significantly higher pain scores at T¹, even though the comfort score remained the same. It is difficult to discern the nuances of this finding, although it may simply mean that women who received one-to-one support were experiencing greater pain and their clinician and family responded by providing one-to-one support.

Although the use of comfort measures and comfort scores at T¹ was not significantly correlated, it is interesting that women who used freedom of movement at T¹ had significantly higher comfort scores at T² and also had significantly higher pain scores at T². Women who have freedom of movement may feel more in control of the birthing process, and therefore have a higher level of comfort. Many studies document that control is important to women during labour (Lowe, 1987; Green, 1993; Halldorsdottir and Karlsdottir, 1996; Hodnett, 2002; Green and Baston, 2003). However, with ambulation comes gravity's pull. Some studies suggest that when women labour in upright positions, they may experience a shorter phase of maximum slope (Andrews and Chrzanowski, 1990; Gupta and Hofmeyr, 2004). Although the upright position may cause contractions to be more frequent and more intense, studies suggest that the cervix tends to dilate faster and the descent of the foetus is more rapid, resulting in a shorter phase of maximum slope and a shorter labour. It makes sense that freedom of movement could positively impact comfort and negatively impact pain levels. Some women may choose to tolerate an increase in pain intensity, if they know their labour may be shorter and they feel in control. It is noteworthy that, in a study of the effects of women walking during labour, the women who walked did not have shorter labours, but 99 per cent said they would like to walk again during labour (Bloom *et al.*, 1998). A test of the speculated relationship between labouring upright and length of labour is beyond the scope of this investigation, but warrants further study.

Women using massage at T² had significantly higher comfort scores. Massage takes many forms and, in theory, it stimulates a variety of sensory receptors in the skin and deeper tissues, bringing about inhibition of pain awareness. A controlled study of touch during active labour compared women's behaviour and vital signs, and found that women in the massage

group had improved coping abilities, greater comfort and lowered systolic blood pressure and pulses than the no-massage group (Simkin, 1995). These findings about touch support those of the current study.

Pain scores at T¹ and T² were positively correlated. There are two possible explanations for this finding. Many of the women in the study controlled their pain by using epidural analgesia. At T¹, 12 out of 53 women were using epidural relief and at T², 27 out of 53 were receiving epidural analgesia. This suggests that, as women's pain increased, they sought out methods to assist them in controlling their pain and the most popular method was pharmacologic. It is unknown whether or not the method of pain control used by each woman was her choice or her clinician's. It is also unknown whether comfort measures were offered as pain increased.

It is noteworthy that pain scores of women who used no medication were not significantly different from those who used medication, other than an epidural. In fact, the group using pain medication other than an epidural had slightly higher (though not significantly higher) pain scores than the unmedicated group. A possible explanation for the stability of pain scores in this group is physiologic. A study of a labouring women's level of plasma beta-endorphins (the body's natural analgesic) suggests that beta-endorphins have a positive effect on pain perception during labour, blunting the pain but not obliterating it (Lowe, 2002). A significant correlation has been demonstrated between plasma concentrations of beta-endorphins and labour pain; the level of beta-endorphins rose as labour pain increased (Bacigalupo *et al.*, 1990; Chan *et al.*, 1993).

Comfort and pain scores were negatively correlated at both T¹ and T². This appears to be a logical finding, but further analysis revealed that women who received epidural analgesia had significantly lower pain scores compared with women who did not. However, at the same time, the comfort scores did not vary significantly between these two groups. Therefore, it seems that the dramatic decrease in the pain scores of women using epidurals caused a statistically significant negative correlation between comfort and pain scores. It was probably more a reflection of the dramatic change in the pain scores than change in the total comfort score that produced the negative correlation. In fact, this finding suggests that the relationship between comfort and pain is not entirely reciprocal, and that the experience of comfort during labour requires more than pain management. Additionally, the finding that pain relief does not necessarily provide comfort is reflected in studies of childbirth satisfaction that demonstrate pain relief does not automatically mean the childbirth experience was satisfying (Hodnett, 2002).

A limitation of this study is the non-experimental design, which does not allow for causal inference or explanation. Using a larger sample size decreases this limitation, but cannot eliminate it. Additionally, convenience sampling carries inherent bias with it, as those willing to participate may not be typical of the population with regard to the phenomenon of interest. This limitation was decreased because the sample was drawn from three different sites in different geographic regions. Also, trend bias was avoided because data collection took place over the span of 18 months.

Conclusion

This study begins to describe the complex comfort needs women have during childbirth. The findings suggest that comfort during childbirth occurs in different contexts and senses of experience, and that comfort is complex, requiring care giver expertise in assessment, evaluation and management. Clinical observations and birth narratives describing comfort and pain relief as different aspects of the experience of labour and birth have been quantified with the use of the CCQ. This preliminary work provides a foundation upon which to build the state of the science about providing pain relief and comfort during childbirth, in an effort to increase options for both women and their clinicians.

ACTIVITIES

Undergraduate

Undertake a concept analysis of 'comfort in labour' and identify how you would confirm the defining attributes of this concept.

Postgraduate

As stated above (p. 211):

A study of a labouring women's level of plasma beta-endorphins (the body's natural analgesic) suggests that beta-endorphins have a positive effect on pain perception during labour, blunting the pain but not obliterating it. (Lowe, 2002)

A significant correlation has been demonstrated between plasma concentrations of beta-endorphins and labour pain; the level of beta-endorphins rose as labour pain increased. (Bacigalupo, et al., 1990; Chan et al., 1993)

Design a research trial to test these assumptions.

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