

---

---

# Women's Evaluation of Intrapartum Nonpharmacological Pain Relief Methods Used during Labor

Sylvia T. Brown, EdD, RN  
Carol Douglas, MSN, RN  
LeeAnn Plaster Flood, MSN, CNM

---

---

## Abstract

A wide variety of pain relief measures are available to women in labor. This retrospective, descriptive survey design study examined which nonpharmacologic pain-relief techniques laboring women use most often and the effectiveness of the chosen techniques. Of the 10 nonpharmacological strategies rated by the sample ( $N=46$ ), breathing techniques, relaxation, acupressure, and massage were found to be the most effective. However, no specific technique or techniques were helpful for all participants. The results provide directions for childbirth educators in designing and implementing an effective childbirth education curriculum that assists women to have empowered birth experiences.

*Journal of Perinatal Education*, 10(3), 1-8; *pain management, labor pain, childbirth education.*

---

---

*SYLVIA BROWN is a professor in the School of Nursing at East Carolina University in Greenville, North Carolina. CAROL DOUGLAS is an instructor in the Nursing Department at Pitt Community College in Greenville, North Carolina. LEEANN PLASTER FLOOD is a nurse-midwife practicing in Fayetteville, North Carolina.*

---

---

For several decades, childbirth educators have focused on the alleviation or reduction of pain and suffering during the childbearing experience. A wide array of non-pharmacological pain relief measures, as well as pharmacological interventions, are presently available to women in labor. Relaxation, breathing techniques, positioning/movement, massage, hydrotherapy, hot/cold therapy, music, guided imagery, acupressure, and aromatherapy are some self-help comfort measures women may initiate during labor to achieve an effective coping level for their labor experience. Lamaze childbirth preparation classes teach the majority of these techniques (Nichols & Humenick, 2000). Women are encouraged to employ a variety of simple, nonpharmacologic techniques to reduce or modify labor pain with no potential for causing harmful

effects to the mother or infant. This study investigated the nonpharmacologic methods women choose to use to manage pain during labor and which methods they found to be most effective. Information obtained from the study can provide direction for childbirth educators in designing and implementing an effective childbirth preparation curriculum.

### Review of Literature

A wide variety of cognitive, behavioral, and sensory interventions may contribute to a parturient's pain management and overall sense of comfort (Lowe, 1996). Included among the benefits of using nonpharmacologic pain techniques in labor are their attributes of being nonintrusive, noninvasive, low-cost, simple, effective, and without adverse effects (Burns & Blamey, 1994; Cook & Wilcox, 1997; Geden, Lower, Beattie, & Beck, 1989; Schuiling & Sampsel, 1999; Simkin, 1995). Nonpharmacologic methods have been shown to promote a higher satisfaction with the labor experience because of perceived control and empowerment (Mackey, 1995; Waldenstrom, Borg, Olsson, Skold, & Wall, 1996).

---

*Relaxation is thought to increase pain tolerance through a number of mechanisms, including the reduction of anxiety, decreased catecholamine response, increased uterine blood flow, and decreased muscle tension.*

---

Cognitive pain management strategies begin with the woman's preparation for childbirth through information gathering. In today's age of high-tech communications, the amount of information available is overwhelming and can be accurate or inaccurate, depending on the source. Childbirth education classes can provide accurate, up-to-date information that assists the parturient to be well prepared for the birth experience. Guided imagery is another powerful cognitive activity that can be used to reduce pain perception by engaging the mind so that awareness of the incoming pain stimuli is reduced (Jones, 1988). All methods of childbirth preparation embrace the notion that the mind is linked to the physiologic

processes and pain messages. Therefore, guiding the parturient's thoughts to pleasant experiences can be an effective pain and coping intervention (Lowe, 1996).

The most common behavioral technique discussed in the pain management literature is relaxation. Relaxation is thought to increase pain tolerance through a number of mechanisms, including the reduction of anxiety, decreased catecholamine response, increased uterine blood flow, and decreased muscle tension (Lowe, 1996). Relaxation is most effective as a pain management strategy when learned and practiced in advance of the labor experience. Commonly used techniques include a focus on specific relaxation and patterned breathing exercises as a distraction from the discomforts of labor (Olds, London, & Ladewig, 1996). Maternal positioning and movement have been found to reduce pain during labor (Lowe, 1996; Simkin, 1995). Women in early labor maintaining a vertical position demonstrate less pain (Melzack, Belanger, & Lacroix, 1991), while some find that specific rhythmic movements increase their tolerance for contraction-related pain. Movement and position changes may decrease pain and enhance uterine blood flow, uterine activity, fetal descent, and personal control (Andrews & Chrzanowski, 1990; Lowe, 1996; Shermer & Raines, 1997).

Sensory interventions include any modality that provides sensory input to promote relaxation, enhance positive thoughts, or modulate the transmission of nociceptive stimuli. Music, touch, massage/effleurage, acupressure, hot/cold therapy, aromatherapy, and hydrotherapy are sensory strategies that may promote comfort. Music has been found to have a significant reduction effect on pain intensity in laboring women (Hugh & Louis, 1985). Durham and Collins (1986) found that music created an atmosphere of relaxation for couples and a common ground for couples to relate with each other and the childbirth educator. Massage has been found to be an effective therapy to decrease pain, anxiety, agitation, and a depressed mood during labor (Field, Hernandez-Reif, Taylor, Quintino, & Burman, 1997). In addition, Field et al. reported that massaged mothers had significantly shorter labors, a shorter hospital stay, and less postpartum depression. The application of hot/cold has been a sensory intervention used for many years. Hot compresses applied on the abdomen, groin, or perineum; a warm blanket over the entire body; and ice packs on the lower back, anus, or perineum are effective

---

pain-relief interventions for labor pain (Simkin, 1995). Acupressure—the application of finger pressure or deep massage to traditional acupuncture points located along the body’s meridians or energy flow lines—has been reported to reduce labor pain and promote progress (Simkin, 1995; Nichols & Humenick, 2000). Burns and Blamey (1994) report that women in labor and their midwives have expressed a high degree of overall satisfaction in using aromatherapy, another sensory intervention, during labor. Whirlpool baths in labor have been demonstrated to have a positive effect on analgesia requirements, condition of the perineum, instrumentation rates, and personal satisfaction (Rush, Burlock, Lambert, Loorley-Millman, Hutchison & Enkin, 1996). Benfield, Herman, Katz, Wilson & Davis (2001) report that hydrotherapy promotes short-term relaxation by decreasing anxiety and pain; additionally, hydrotherapy is associated with a positive plasma volume shift, thus correcting uterine dyskinesia while decreasing the total length of labor and need for analgesics.

Controlling pain without harm to mother, fetus, or labor progress remains a primary focus during the labor experience. Pharmacologic measures for labor generally have been found to be more effective than nonpharmacologic measures in lowering pain levels; however, they are more costly and have potential adverse effects (CNM Data Group, 1998; Dickersin, 1989). Childbirth educators must honor the mother’s ability and right to choose how she will address pain, whether or not her choice is in agreement with the educator’s philosophy of pain management during labor (Jiménez, 1996). While the traditional focus in Lamaze education has been on achieving a childbirth that is both painless and natural, many clients today are selecting epidural anesthesia to assure a “painless” childbirth. Jiménez (1996) suggests that the focus must change from pain management to comfort management, as educators equip clients with

---

*Childbirth educators must honor the mother’s ability and right to choose how she will address pain, whether or not her choice is in agreement with the educator’s philosophy of pain management during labor.*

---

skills that can result in increased comfort. The use of nondrug interventions should complement, not replace, pharmacologic interventions for the management of labor and delivery pain (Acute Pain Management Guideline Panel, 1992; CNM Data Group, 1998; McCaffery & Pasero, 1999). Although nonpharmacologic methods can be effective in helping patients relax during labor, few well-controlled studies demonstrate that these methods actually reduce perceived pain (McCaffery & Pasero, 1999). Patient preferences and perceived efficacy of the various modalities are needed to determine strategies to employ during the labor experience. Therefore, this study examined which nonpharmacologic pain relief techniques laboring women used most often and the effectiveness of the techniques used.

## Method

A retrospective, descriptive survey design was used to determine which nonpharmacologic pain relief techniques laboring women used most often and which techniques they perceived to be most effective. The sample consisted of women who had attended childbirth preparation classes conducted by a Lamaze Certified Childbirth Educator (LCCE), and who were at least 18 years old, literate in English, within 6 months postpartum, and willing to participate in the study.

### *Instrument*

The investigators designed a survey instrument, consisting of 40 items, to gather data. Items included demographic data, obstetric history, events during pregnancy and labor, presence of a support person, and a list of 10 common nonpharmacologic childbirth pain-management techniques. Subjects were requested to identify whether or not these techniques were “taught” or “not taught” in the childbirth preparation classes they attended. Subjects then were asked to complete a section in which they ranked these techniques as *very effective*, *somewhat effective*, *not very effective*, or *not used during labor*. The specific nonpharmacologic pain methods chosen for inclusion on this survey were selected because, according to the literature, evidence reports that they are beneficial in assisting women to cope effectively with the pain of labor. Additionally, a comment section was provided to allow subjects further input.

A pilot study was completed prior to the formal study. Eleven subjects who met the inclusion criteria completed the instrument. Responses were reviewed by the investigators to ascertain appropriateness of the survey instrument. The review of the pilot surveys confirmed that the survey topics were representative of the methods women were taught in childbirth preparation classes and methods women were able to utilize during labor.

**Procedure**

Permission to conduct the study was obtained through the Policy and Review Committee on Human Research at a university setting. Cover letters were designed and attached to each survey and addressed the purpose of the study, informed consent, confidentiality, and directions for completing and submitting the survey.

The association headquarters for Lamaze International was contacted to obtain a list of current LCCEs in a selected state in the southeastern United States. Ten LCCEs were randomly selected, contacted, informed of the study, and asked for their willingness to participate by submitting names and addresses of childbirth education participants. The researchers mailed the survey directly to 90 postpartum women from the list provided. Self-addressed, stamped envelopes were provided to all participants for the return of the surveys to the researchers. The final convenience sample size consisted of 46 women, which represented a 51% return rate.

**Results**

The sample consisted of 37 primiparas and 9 multiparas ranging in parity from two to four children. The majority (82.6%) were Caucasian. Participants were primarily between 20 to 30 years of age (58.7%) and the majority were married (93.5%). The majority of women (56.5%) had completed two to four years of college or higher; the remaining 43.5% had completed tenth to twelfth grades of high school (see Table 1).

Participants indicated that their major source of support during labor was the father of the baby (84.8%), while their mother and the nurse followed in ranking order. The majority of the sample (97.8%) indicated they read books and magazines about labor and delivery, as well as literature given by health care providers (91.3%) in preparation for childbirth. The overwhelming major-

**Table 1** Characteristics of Sample

	N = 46	
	Frequency	Percent
<b>Age</b>		
< 20 years old	4	(8.7)
20–30 years old	27	(58.7)
31–40 years old	14	(30.4)
> 40 years old	1	(2.2)
<b>Ethnicity</b>		
African American	6	(13.0)
Caucasian	38	(82.6)
Hispanic	0	(0)
Other	2	(4.3)
<b>Highest Educational Level</b>		
Partial High School	3	(6.5)
High School Completion	17	(37.0)
Two-Year College	7	(15.2)
Four-Year College	13	(28.3)
Graduate School	6	(13.0)
<b>Major Support during Labor</b>		
Father of Baby	39	(84.8)
Your Mother	10	(21.7)
Nurse	7	(15.2)
Physician	4	(8.7)
Midwife	0	(0)
Other	2	(4.3)

ity (93.5%) characterized their partner's support and participation during their pregnancy as listening and demonstrating concern during their pregnancy, followed by attending childbirth classes with them (89.1%) and attending prenatal visits (69.6%).

When asked to describe their general feelings before their labor began, the sample indicated the following responses: frightened (52.2%), relaxed (26.1%), confident (34.8%), doubtful about their ability to deal with pain (43.5%), confident in their physician/midwife (60.9%), felt good about self and pregnancy (52.2%), wanted to try a "natural" birth (45.7%), and planned on an epidural and/or pain medicine (34.8%). The majority (71.7%) indicated the use of pain medication during labor and approximately one-third (34.8%) had an epidural during labor. The majority had a vaginal delivery (73.9%), with their labor lasting less than 12 hours (71.1%) and the baby weighing five to nine pounds (97.8%).

A list of 10 nonpharmacologic pain management techniques was provided for participants to indicate if they were taught these strategies in their Lamaze classes and

if they used the strategies. If they did employ the strategies, the participants were then asked to rate the effectiveness of their use. Tables 2 and 3 and Figure 1 provide a summary of findings. All participants indicated they were taught relaxation, breathing, position change, and massage/effleurage in their childbirth preparation classes. The only listed technique that was not taught in the majority of classes was aromatherapy. All of the listed techniques were used by at least one participant in the sample, with breathing and relaxation being the predominant techniques employed; the least used strategies were hydrotherapy, music, and aromatherapy. Participants reported breathing techniques as the most effective pain relieving technique used during labor, followed by relaxation, acupressure, and massage.

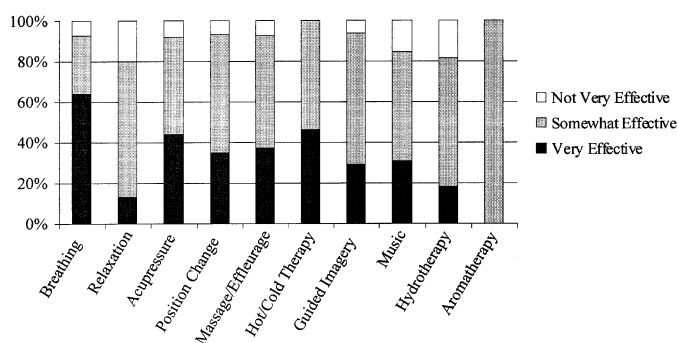
Multiparas and primiparas were very similar in the techniques they used and in the ones they found effective.

**Table 2** Nonpharmacological Pain Relief Strategies Taught and Used

N = 46		
	Taught	Used
Breathing	46 (100%)	42 (91.3%)
Relaxation	46 (100%)	40 (87.0%)
Acupressure	37 (80.4%)	23 (50.0%)
Position Change	46 (100%)	26 (56.5%)
Massage/Effleurage	46 (100%)	25 (54.3%)
Hot/Cold Therapy	41 (91.1%)	13 (28.0%)
Guided Imagery	40 (87.0%)	14 (31.1%)
Music	44 (95.7%)	6 (13.0%)
Hydrotherapy	44 (95.7%)	5 (10.9%)
Aromatherapy	21 (45.7%)	1 (2.2%)

**Table 3** Reported Effectiveness of Nonpharmacological Pain Relief Strategies

N = 46				
	Very Effective	Somewhat Effective	Not Very Effective	Not Used
Breathing	27 (58.7%)	12 (26.1%)	3 (6.5%)	4 (8.7%)
Relaxation	10 (21.7%)	23 (50.0%)	7 (15.2%)	6 (13.0%)
Acupressure	10 (21.7%)	11 (23.9%)	2 (4.3%)	23 (50.0%)
Position Change	9 (19.6%)	15 (32.6%)	2 (4.3%)	20 (43.5%)
Massage/Effleurage	9 (19.6%)	14 (30.4%)	2 (4.3%)	21 (45.7%)
Hot/Cold Therapy	6 (13.0%)	7 (15.2%)	0 (0.0%)	33 (71.7%)
Guided Imagery	4 (8.7%)	9 (19.6%)	1 (2.2%)	31 (67.4%)
Music	2 (4.3%)	3 (6.5%)	1 (2.2%)	40 (87.0%)
Hydrotherapy	1 (2.2%)	3 (6.5%)	1 (2.2%)	41 (89.1%)
Aromatherapy	0 (0.0%)	1 (2.2%)	0 (0.0%)	45 (97.8%)



**Figure 1** Reported Effectiveness of Nonpharmacological Pain Relief Strategies by Women Who Used Them in Labor

*Participants reported breathing techniques as the most effective pain relieving technique used during labor, followed by relaxation, acupressure, and massage.*

Identified differences included that primiparas tended to use hot/cold therapy and music more often than multiparas, while multiparas used frequent changes of position and hydrotherapy more often than primiparas. The multiparas and primiparas were similar in their use of the other therapies. Primiparas found massage and acupressure more effective than did multiparas. The remaining therapies were similar in effectiveness among primiparas and multiparas.



In terms of medication usage, primiparas were significantly more likely to use pain medication than were multiparas (29 out of 34 = 85% vs. 4 out of 9 = 44%;  $p = .02$ ). Both nonmedication users and pain medication users were similar in their use of relaxation, breathing, change of position, acupressure, and guided imagery. Music and hot/cold therapy were employed more often by pain medication users than by nonusers, while hydrotherapy and massage were more often employed by non-medication users than by pain medication users. Massage and acupressure were reportedly more effective for pain medication users than for nonusers, while relaxation, breathing, and frequent changes of position were reportedly more effective for nonmedication users than for pain medication users. Although only one pain medication user and three nonmedication users employed hydrotherapy, all of the nonmedication users found this strategy effective.

---

---

*. . . labor pain is a subjective multidimensional experience . . . . Not one specific technique or combination of interventions helps all women or even the same woman throughout the labor experience.*

---

---

## Discussion

The findings of this study are congruent with existing theoretical and research evidence, which suggest that labor pain is a subjective multidimensional experience (Acute Pain Management Guideline Panel, 1992; Brown, Campbell, & Kurtz, 1989; Lowe, 1996; McCaffery & Pasero, 1999). Not one specific technique or combination of interventions helps all women or even the same woman throughout the labor experience (Hodnett, 1996). All nonpharmacologic techniques explored in this study were found to be helpful in some degree for some study participants, while other participants indicated the same strategies were less effective or ineffective.

Some techniques, such as hydrotherapy and aromatherapy, were used infrequently. The limitations or restrictions imposed by the birth setting may be a possible contributing factor to the infrequency in use of some

techniques; however, the researchers did not request birth setting information as part of the demographic data on the survey. Thus, this represents a limitation of the study.

Anecdotal responses indicated that some strategies even enhanced the pain experience. For example, one participant commented, "Massage did not help because it was distracting for me and intensified the pain. I enjoy massage/touch when I'm not in labor, but it was not helpful during this labor or my three previous deliveries." Yet, over half the sample used massage and the overwhelming majority found it to be an effective strategy for pain management. Most techniques investigated had a range of effectiveness from very effective to not very effective indicated by participants; thus, demonstrating again the subjective nature of pain. Another participant commented that breathing techniques and support from her husband were crucial to her management of pain. Only three participants indicated that breathing techniques were ineffective; however, this strategy was found to be the most helpful technique for most of the sample. The father of the baby was the major support for mothers in this study. In this study, no single measure was found to be the key to effective coping and management of pain in labor.

The influence of psychologic factors on pain perception is a well-known clinical phenomenon (Lowe, 1996). An interesting comment from one participant spoke to the psychological preparation needed, as well as the feeling of mastery of the birth experience that women strive for. This participant stated, "It's always an encouragement to see videos and hear about Moms who have managed a delivery naturally without painkillers—but if you don't manage it yourself, then it makes you feel like you failed." Thus, childbirth educators must focus on strategies that promote comfort and enable women to identify coping mechanisms that provide greater participation in and mastery of the birth event while, at the same time, instilling acceptance in whatever their accomplishments.

Interestingly, over half of the sample indicated they felt frightened about the labor experience and almost half felt doubtful of their ability to deal with pain. Only one-third of the sample expressed a feeling of confidence before labor. Since the majority of the participants were primiparas, this lack of confidence and fear of the unknown is, to some degree, to be expected. However

---

---

[C]hildbirth educators must focus on strategies that promote comfort and enable women to identify coping mechanisms that provide greater participation in and mastery of the birth event while, at the same time, instilling acceptance in whatever their accomplishments.

---

---

all participants had completed childbirth preparation classes designed to give them confidence. In addition, primiparas were significantly more likely to use pain medication than multiparas in this sample. This finding also points to feelings of doubtfulness in their ability to deal with the pain experience.

### Implications for Practice

Numerous nonpharmacologic methods of pain relief can be initiated during labor. Nurses and childbirth educators must be willing to provide comprehensive childbirth education that introduces women to a variety of pain management options. Nurses and childbirth educators must also be willing to provide sensitive, continuous care that is a collaborative effort with the woman to assist her in coping with pain and mastering the experience of childbirth. Exposure to a variety of pain management strategies in childbirth education classes can allow more options for clients to use in the childbirth experience.

Psychological preparation is also extremely important due to the close link between pain and anxiety. Studies show that confidence is greater after childbirth education and that confidence is powerfully related to decreased pain perception and decreased medication/analgesia use during labor (Lowe, 1996). However, the low level of prelabor confidence and the high level of prelabor frightened feelings and doubt in successfully dealing with pain—as reported by this sample—indicate a need for additional strategies to build confidence during childbirth education. Childbirth educators can have a positive influence in the development of confidence and feelings of empowerment in the expectant mother.

It is hoped that a greater use of techniques can contribute to better outcomes, lower costs, and higher patient

satisfaction. Continued investigation is needed to determine pain-relief strategies that are safe and effective and enhance patient satisfaction during the birth experience, which is one of life's most memorable and challenging experiences.

### Authors' Note

This project was partially funded by Beta Nu chapter, Sigma Theta Tau.

### References

- Acute Pain Management Guideline Panel. (1992). *Acute pain management: Operative or medical procedures and trauma. Clinical practice guideline*. (Agency for Health Care Policy and Research Publication No. 92-0032). Rockville, MD: Agency for Health Care Policy and Research, United States Department of Health and Human Services, Public Health Service.
- Andrews, C. M., & Chrzanowski, M. (1990). Maternal position, labor, and comfort. *Applied Nursing Research*, 3(1), 7-13.
- Benfield, R. D., Herman, J., Katz, V. L., Wilson, S. P., & Davis, J. M. (2001). Hydrotherapy in labor. *Research in Nursing & Health*, 24(1), 57-67.
- Brown, S. T., Campbell, D., & Kurtz, A. (1989). Characteristics of labor pain at two stages of cervical dilation. *Pain*, 38, 289-295.
- Burns, E., & Blamey, C. (1994). Using aromatherapy in childbirth. *Nursing Times*, 90(9), 54-60.
- CNM Data Group. (1998). Midwifery management of pain in labor. *Journal of Nurse-Midwifery*, 43(2), 77-82.
- Cook, A., & Wilcox, G. (1997). Pressuring pain: Alternative therapies for labor pain management. *Association of Women's Health, Obstetric and Neonatal Nurses's Lifelines*, 1, 36-41.
- Dickersin, K. (1989). Pharmacological control of pain during labour. In: Chalmers, I., Enkin, M., & Keirse (MJNC eds.). *Effective Care in Pregnancy and Childbirth* (vol. 2). Oxford: Oxford University Press, 913-950.
- Durham, L., & Collins, M. (1986). The effect of music as a conditioning aid in prepared childbirth education. *Journal of Obstetric, Gynecologic and Neonatal Nursing*, 15, 268-270.
- Field, T., Hernandez-Reif, M., Taylor, S., Quintino, O., & Burman, I. (1997). Labor pain is reduced by massage therapy. *Journal of Psychosomatic Obstetrics & Gynecology*, 18(4), 286-291.
- Geden, E. A., Lower, M., Beattie, S., & Beck, N. (1989). Effects

---

## Women's Evaluation of Intrapartum Nonpharmacological Pain Relief Methods Used during Labor

- of music and imagery on physiologic and self-report of analogued labor pain. *Nursing Research*, 38(1), 37-41.
- Hodnett, E. (1996). Nursing support of the laboring woman. *Journal of Obstetric, Gynecologic and Neonatal Nursing*, 25, 257-264.
- Hugh, C., & Louis, B. (1985). *The effect of music on labor analogue pain*. Master's thesis, The University of Arizona. University Microfilms International. Ann Arbor, MI.
- Jiménez, S. L. M. (1996). Comfort management: A conceptual framework for exploring issues of pain and comfort. *The Journal of Perinatal Education*, 5(4), 67-70.
- Jones, C. (1988). *Visualizations for an easier childbirth*. New York: Meadowbrook.
- Lowe, N. K. (1996). The pain and discomfort of labor and birth. *Journal of Obstetric, Gynecologic and Neonatal Nursing*, 25(1), 82-89.
- Mackey, M. C. (1995). Women's evaluation of their childbirth performance. *Maternal-Child Nursing Journal*, 23(2), 57-72.
- McCaffery, M., & Pasero, C. (1999). *Pain—Clinical manual*. St. Louis: Mosby.
- Melzack, R., Belanger, E., & Lacroix, R. (1991). Labor pain: Effect of maternal position on front and back pain. *Journal of Pain and Symptom Management*, 6(8), 476-480.
- Nichols, F. H., & Humenick, S. S. (Eds.). (2000). *Childbirth education: Practice, research, and theory* (2nd ed.). Philadelphia: W.B. Saunders Company.
- Olds, S. B., London, M. L., & Ladewig, P. W. (1996). *Maternal newborn nursing—A family centered approach*. Menlo Park, CA: Addison Wesley.
- Rush, J., Burlock, S., Lambert, K., Loosley-Millman, M., Hutchison, B., & Enkin, M. (1996). The effects of whirlpool baths in labor: A randomized, controlled trial. *Birth*, 23(3), 136-143.
- Schuiling, K. D., & Sampsel, C. M. (1999). Comfort in labor and midwifery art. *Image: Journal of Nursing Scholarship*, 31(1), 77-81.
- Shermer, R. H., & Raines, D. A. (1997). Positioning during the second stage of labor: Moving back to basics. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 26, 727-734.
- Simkin, P. (1995). Reducing pain and enhancing progress in labor: A guide to nonpharmacologic methods for maternity caregivers. *Birth*, 22(3), 161-170.
- Waldenstrom, U., Borg, I. M., Olsson, B., Skold, M., & Wall, S. (1996). The childbirth experience: A study of 295 mothers. *Birth*, 23, 144-153.

### Adolescent Birthrate Falls to Record Low, Study Finds

The 1999 adolescent birthrate was the lowest seen in the United States since 1940, according to a study published recently by the Centers for Disease Control and Prevention. In addition, in 1999 the number of triplet births and higher-order multiple births declined for the first time in 10 years.

The report findings include the following:

- In 1999 the birthrate among adolescents ages 15 to 19 was 49.6 births per 1,000 female adolescents; in 1991 the rate was 62.1 births per 1,000 female adolescents;
- The rate of twin births increased by 3% from 1998 to 1999, and the rate of triplet births and other higher-order multiple births fell by 4%;
- In 1999 first-time mothers' median age increased to 24.5, up from 1998;
- From 1998 to 1999 the number of births to unmarried women increased by 1% to 1,308,560, the highest number ever reported;
- The rate of pregnant women who received prenatal care increased from 82.8% in 1998 to 83.2% in 1999;
- The rate of women who smoked cigarettes during pregnancy, which has fallen steadily since 1989, declined to 12.6% in 1999, but tobacco use by pregnant adolescents continued to increase; and
- The rate of preterm births (less than 37 weeks' gestation) increased slightly, rising from 11.6% in 1998 to 11.8% in 1999.

Ventura, S.J., Martin, J.A., Curtin, S.C., et al. (2001). Births: Final data for 1999. National Vital Statistics Reports 49(1):1-4. Report available at [www.cdc.gov/nchs](http://www.cdc.gov/nchs).

Centers for Disease Control and Prevention (2001, April 17). Higher order multiple births drop for first time in a decade. Press release available at [www.cdc.gov/nchs/releases/01news/multibir.htm](http://www.cdc.gov/nchs/releases/01news/multibir.htm).

*The above news brief appeared in the April 20, 2001, electronic issue of MCH Alert ([www.ncemch.org/alert/alert042001.htm](http://www.ncemch.org/alert/alert042001.htm)). MCH Alert is produced by the National Center for Education in Maternal and Child Health in Arlington, VA ([www.ncemch.org/alert](http://www.ncemch.org/alert)).*