A Visual Aid Designed to Teach *Cervical Dilation*

by Maryellen B. Miller, RN MS CFLE

Abstract: Teaching cervical dilation in childbirth education classes for adolescents is challenging due to the adolescent's cognitive development and limited knowledge of the labor and delivery process. New cervical dilation visual aids debuted in this study compare metric measurement of cervical dilation to easily recognizable items. A brief opinion survey was completed by 57 pregnant teens and young adults, and their support persons to assess the effectiveness of the teaching aid. A majority (> 90%) agreed the visual aids helped them learn about cervical dilation. In addition to highlighting the issue of health literacy, the posters also address numeracy. Pregnant adolescents' understanding of cervical dilation seems to be enhanced by the new visual aids. Pregnant women of all ages and literacy levels may also find them helpful.

Keywords: adolescent childbirth education, cervical dilation, visual aids, health literacy, numeracy

Introduction

The goal of childbirth education is to provide the mother with information, support, and encouragement, as well as coping skills to use during labor and delivery (Lothian & Hotelling, 2012). Childbirth educators must adapt their approach for pregnant adolescents using knowledge about the adolescents' developmental stage and different learning styles to tailor prenatal classes using a variety of teaching techniques (Broussard & Broussard, 2010; Tilghman & Lovette, 2008). This project evaluated the perceived effectiveness of a cervical dilation visual aid during instruction of the cervical dilation process in childbirth education classes for adolescents. Descriptive and anecdotal feedback was gathered from the pregnant participants and their support persons.

Background

A limited number of years of education developing literacy and numerical skills may contribute to pregnant adolescents' difficulty reading health care instructions, including lists and charts (Stang, 2000). Learning strategies should be designed to increase the adolescent's understanding of pregnancy and birth (Broussard & Broussard, 2010). Childbirth education topics should be explained in simple language and illustrated with concrete visual aids. Visual images accompanied by short explanations are helpful in explaining processes that are difficult to describe (Cook, 2011), such as cervical dilation. Brightly colored visual aids using photos or drawings, brief text or bullet points, and surrounding white space are appealing, readable, and spark curiosity and interest in the topic (Broussard & Broussard, 2010; Magness, 2012; Podgurski, 2000; Standifird, 2005).

Adolescents present a unique challenge in childbirth education. The vulnerable pregnant adolescent is different from other pregnant women in terms of her social and psychological development as well as her physical response to the demands of pregnancy (Tilghman & Lovette, 2008). Adolescents often have difficulty with abstract thinking; many are still in the stage of concrete operations, thinking and functioning on a concrete level (Feinstein, 2004; Standifird, 2005; Ylvisaker, 2008). While the transition from concrete thinking to formal logical operations usually occurs between ages 11 and 14, each adolescent progresses at varying rates in developing the ability to think in more complex ways (Herrman, 2005). Research suggests that teenagers who have experienced a pregnancy crisis for the first time

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have had little opportunity to consolidate formal operational thinking around the issue of pregnancy (Fantasia, 2008; Pedlow & Carey, 2004). Educators and health professionals must use their knowledge of adolescent cognitive ability to recognize the developmental stages of adolescent parents and design teaching methods that are effective (Fantasia, 2008; Herrman, 2005; Magness, 2012; Standifird, 2005; Fantasia, 2008).

Fear of pain during labor is a main concern for adolescents. They should be guided through the childbirth process with explanations in simple terms accompanied by helpful visual aids (Sauls, 2010). As the adolescent begins to understand what to expect through each stage of labor, she will feel more in control and have a reduction in fear and anxiety.

Pregnant women of all ages need more information in order to be fully involved in their care (Polomeno, 2009; Humenick, 2004). Suggested strategies to use with teens are very similar to those recommended for low literacy populations (Banister, Begoray, & Daly, 2011). For example, using simple language and explanations, large print, as well as using familiar images in illustrations, all help convey the target information to the learner (Wilson, 2011).

Even obstetric patients with high literacy skills may find it difficult to understand labor and delivery information because they are unfamiliar with the medical terminology. Research shows that patients, regardless of literacy level, prefer simple, easy-to-read materials (Houts, Doak, Doak, & Loscalzo, 2006). The findings of several studies indicate that simple, realistic pictures of familiar objects accompanied by simple language will communicate the message as well as enhance the recall and comprehension of the instructional health materials (Centers for Disease Control and Prevention, 2010; Hill, 2008; Wilson 2011).

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The Cervical Dilation Visual Aids

An important topic of childbirth education is the stages of labor, including explanation of the cervical dilation process, which is generally supplemented by traditional visual aids depicting the progressive increases in the dilation of the cervix with a series of metric measurement circles. The new cervical dilation visual aids (Figure 1) debuted in this study compare metric measurement of cervical dilation to easily recognizable foods and game balls to visually connect the new information of cervical dilation in labor progression to the adolescent's existing knowledge of the general size and measurement of everyday foods and objects. The visual aid has three versions: snack foods, fruit, and game balls (copyrighted). All versions have a pastel background with bold,

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Figure 1. Cervical Dilation Visual Aidsa

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block lettering stating "Labor contractions dilate the cervix," both in English and in Spanish ("Los dolores de parto dilatan el cuello uterino"). All versions show the progression of cervical dilation measurements in the sequence of 1cm, 2 cm, 4 cm, 6 cm, 8 cm, and 10 cm. The snack foods version uses a small cereal circle to illustrate the 1 cm opening, a peppermint to show the 2 cm opening, a chocolate mint patty to illustrate the 4 cm opening, a chocolate chip cookie to show the 6 cm opening, a round brownie to illustrate the 8 cm opening, and a rice cake to show the full 10 cm dilation. The fruit version uses a blueberry, a cherry, and circular slices of lime, lemon, orange, and grapefruit respectively for the sequence of measurements. The game balls version uses a marble, a bouncy ball, a golf ball, a red rubber ball, a whiffle ball, and a softball respectively for the sequence of measurements. According to the Flesch-Kincaid index, the reading level of the posters is 9th grade.

In addition to making an easily understandable visual connection to the labor dilation process, the cervical dilation visual aids used in this study also address the issue of numeracy, a component of health literacy. In everyday life, consumers generally use standard measurements, while the medical community, including childbirth educators and the health professionals who provide care in hospital labor and delivery units, use the metric system when measuring and reporting cervical dilation. This confuses many people (Peters, Hibbard, Slovic, & Dieckmann, 2007; Golbeck, Ahlers-Schmidt, Paschal, & Dismuke, 2005). The various sizes of food items and balls on the visual aids have the corresponding metric measurement beneath them. A visual connection is made to help the pregnant woman as well as her support person grasp what each particular metric measurement of dilation looks like.

Methods

The cervical dilation visual aids were introduced to pregnant adolescents and young adults (n = 32) as well as their support persons: boyfriends (n = 15) and grandmothers-to-be (n = 10) in childbirth preparation classes held at six community hospitals and sponsored by Child, Home & Community (CHC), a United Way agency serving pregnant and parenting teens in two counties adjacent to the Philadelphia metropolitan area. The use of an opinion survey as part of the childbirth education course was approved by the institutional review board (IRB) of Child, Home & Community. Four certified childbirth educators from CHC used all three of the posters as teaching tools in the instruction of cervical dilation, as part of their labor and delivery lessons in the twelve-week Focus on Motherhood (FOM) childbirth preparation curriculum.

The pregnant participants and their support persons completed a brief opinion survey regarding the posters. Assessment of perception of the visual aids in terms of their effectiveness in learning about cervical dilation was gathered via two questions based on a four-point Likert scale: *"I picture the fruits/snacks/balls in my mind when I think of cervical dilation."* and *"Using fruits/snacks/balls help me understand cervical dilation."* The third question in the survey measured preference for one (or none) of the versions of the visual aids by asking: *"Which poster did you find most helpful or memorable?"*

The survey also gathered demographic information regarding age, gender, number of weeks pregnant, highest grade level of school completed, ethnicity, and whether they considered their home to be in urban, suburban, or rural communities.

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Table 1. Childbirth Education Participants: Age and Educational Grade Level

Demographics	Pregnant Participants N=32	Boyfriends N=15	Grandmothers-to-Be N=10
Mean age	19.1	21	47
Age range	15-26	16-32	37-59
Mean grade level	11.1	12	13
Grade level range	9th to 1 yr college	10th to 2 yr college	12th to 2 yr college

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Results

The participants in the six childbirth preparation classes were given the surveys after instruction in cervical dilation as part of labor and delivery. The pregnant participants had a mean number of 29 weeks gestation (range 15-38). Demographic variables of the participants with regard to age and years of school completed are shown in Table 1. While the participants' age varied considerably, there was little variance in the range of educational levels. Ethnically, the pregnant participants and their support persons were 59% White, 24% African American, 11% Latino, and 6% Asian or Native American. Overall, eighty-four percent of the participants described themselves as living in the suburbs; 11% lived in the city, and the remaining 5% lived in a rural setting.

Survey results, as summarized in Table 2, indicate that the pregnant participants favored the fruit and snack food versions equally (36% each). The sports/game ball version was a strong favorite (61%) for the boyfriends and the fruit version was a leading selection (55%) for the grandmothers-to-be. Overall, there was a general preference for the fruit poster. A robust majority (>90%) was noted for the posters to be considered helpful in forming an easy to understand visual reference. Comments from the participants include, "I remember the charts when I think about my cervix opening," from a pregnant adolescent and from a boyfriend, "The poster with the cereal and cookie explains it perfectly."

Anecdotal feedback from the four instructors who used the visual aids in conjunction with their other instructional materials includes, "The posters were very helpful in explaining a difficult topic. They made an impression on the teens by connecting the information to something they already knew." Also, "The posters are a good teaching supplement to my 3D knitted uterus and pelvis."

Discussion

The pregnant adolescents and young adults, their support persons, and the childbirth educators considered the use of the visual aids to be memorable as well as helpful in forming an understandable visual reference of the cervical dilation stages. The favorable opinions of the posters were consistent across the teen and adult age groups, the various levels of education, the diverse ethnicities, and the range of living circumstances. Limitation exists in this opinion-based type of study. Suggestions for further research include creating a survey designed to evaluate the knowledge gained when the visual aids are used to accompany instruction of the cervical dilation process. This could be followed by comparison of adolescent childbirth classes using the posters to classes using traditional visual aids.

While many healthcare materials for patient education have a 10th grade reading level (Wilson, 2009), the cervical dilation charts have a Flesch-Kincaid reading level of 9th grade.

By pairing the metric cervical dilation information to easily recognizable foods/balls, the visual aids make a mean-

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Table 2. Childbirth Education Participants: Poster Perceptions and Preferences

Opinion Question	Pregnant Participants	Boyfriends	Grandmothers-to-Be	Overall Average
I picture the fruits/snacks/balls in my mind when I think about cervical dilation.	90%	100%	80%	90%
Using fruits/snacks/balls help me understand cervical dilation.	93%	100%	100%	97.6%
Version Preference				
Which poster did you find most helpful or memorable?				
Fruits	36%	25%	55%	43%
Snack foods	36%	14%	45%	28%
Sports/game balls	28%	61%	0%	29%

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ingful connection in the mind of the learner. Considering the implications for health literacy and numeracy, the evaluation of the posters could then be extended to other childbirth education classes instructing pregnant women of various ages and literacy levels along with their support persons.

Conclusion

There is a clear need for dynamic teaching strategies to meet the pregnant adolescent's learning needs. The cervical dilation visual aids contribute to the development of innovative childbirth education materials for pregnant adolescents and may be helpful for pregnant women of all ages and literacy levels.

Acknowledgments

The author acknowledges the participants in the childbirth classes as well as the childbirth educators and staff of Child, Home & Community of Doylestown, PA.

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