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The Effect of an Educational Hunger Cues Intervention on Awareness in Mothers with Infants

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Author Note

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Abstract

Stress to an infant can inhibit the ability to properly feed and gain the nutrients that are essential for efficient growth. Mothers who are unaware of early hunger cues from their infant have the potential to stress the infant if their early hunger cues are not attended to. The purpose of this study was to examine the effect of an educational hunger cues intervention on awareness in mothers with an infant. The following research question will be answered: Will new mothers who complete an educational intervention show increased awareness of hunger cues in their infants, in comparison to before the intervention? This quasi-experimental pre-test/post-test study is guided by Pender's Health Promotion Theory. A convenience sample was recruited at a Midwest agency that provides support to women with infants. Demographic and pre-intervention data was collected from participants before taking part in an educational intervention about recognizing hunger cues of infants. Post-intervention data was immediately collected after the conclusion of the intervention. A dependent *t*-test was used to determine the effects of the intervention on awareness of hunger cues.

Nearly four million babies were born in the United States in 2011 (CDC, 2013). The period after birth is a crucial time to establish bonding and trust between infants and parents that can set the foundation of trust for the rest of their life. Bonding is the development of a trusting relationship between parents and infants (O'Connor, 2012). Nurturing and decreasing stress in infants play significant roles in the emotional and psychological health of the infants. One way to establish a bond is through breastfeeding on demand or by hunger cues (Hotelling, 2004). When infants are hungry and display early hunger cues, mothers show a trusting response by putting infants to the breast to feed. If this does not happen, as time goes on, infants may become hungrier until physically upset and crying. Once this happens, parents may become stressed,

which infants can sense. This may then lead to further upsetting infants, making it harder to calm them down, which must be done before eating. This in return lengthens the time between feedings. Studies have shown that infants who experience this cycle regularly tend to rock back and forth continuously to give themselves the nurturing stimulus they do not receive otherwise (Hotelling, 2004). They adapt because they do not trust their caregivers and have learned others may not be able to respond to them, so they attempt to interact less with others (Hotelling, 2004).

Studies have shown that infants who are breastfed on demand, experienced skin to skin contact, and are attended to, have less need to cry. The more nurtured and attended to infants also grow up with less aggression than those who were not (Hotelling, 2004). “Demand feeding” or “cue feeding,” involves mothers initiating feedings based on hunger cues. Research shows that feeding based on hunger cues works best for infants (Iwinski, 2003). To do this, mothers must be able to identify universal hunger cues in their infants. Hunger cues are signs the infants shows, vocally or physically, to indicate they are hungry. Examples of early hunger cues include sucking, rooting, mouthing, hands to mouth, fidgeting, and muscle tension such as closed fists and flexion of the arms (Ladewig, London, & Davidson, 2014). To provide appropriate care for infants, it is important for mothers to understand communication signs like these. This mutual understanding lead to happier and healthier infants (Hotelling, 2004).

The purpose of this study was to examine the effect of an educational hunger cues intervention on awareness in mothers with an infant. The following research question was answered: Will mothers with an infant who complete an educational hunger cues intervention show increased awareness of hunger cues in their infants, in comparison to before the intervention?

Review of the Literature

Many mothers are unaware of natural infant hunger cues, such as the rooting reflex. Some mothers assume that hunger is signaled by an infant crying. According to Hotelling, communication between the mother and the infant is necessary to form a healthy bond that will promote trust. Mothers who recognize early hunger cues can feed their infant more effectively (2004).

When natural cues are not used, the hunger of an infant can go unnoticed, breaking the trust between the mother and infant. This can potentially have long term feeding and wellness effects. It was discovered by Kandiah, Bunah, and Amend, (2011) that mothers who receive extra information about breastfeeding and hunger signals increased the duration of feeding time. Increased breastfeeding time can promote a healthy appetite in the infant which can contribute to their health. A lengthening in breastfeeding also increases bonding time spent between the mother and the infant. These factors as a whole promote healthy eating habits and a positive mother-infant relationship. Infant feeding creates trust between the mother and the infant and that it can have great influence on the infant's health and well-being later in life. The approach and experience that the infant has during feedings in the early months through young age could potentially have positive or negative influence on eating habits and health years down the road.

Worobey, Lopez, and Hoffman (2009) found that mothers who breastfeed are more responsive to signals of hunger and fullness. Infants should be fed when showing hunger cues as opposed to following a scheduled routine. Gross et al (2010) studied mothers who pressure feed their infants to finish a bottle even when the infant is full. Scheduled and pressure feedings can lead to overfeeding the infant which may cause unhealthy weight gain. Hunger is an intrinsic, natural response and should not be controlled by scheduling. Breastfeeding has the ability to

sensitize a mother's recognition to satiety and therefore can prevent future overeating and obesity (Taveras et al., 2006; Lagan et al., 2014). Healthy eating habits begin immediately after birth and are controlled by the parent's decision on when and how to feed. According to Hodges, Hughes, Hopkinson and Fisher (2007) and Kramer, Moodie, Dahhou, and Platt (2011) parents shape infant feeding and eating habits that are often carried on for the rest of the infant's life. Hodges et al (2013) later studied that recognition of hunger through cues promotes healthy eating and prevents overfeeding of infants. By educating mothers, this information can be integrated to close the gap in knowledge that exists in the realm of low awareness of effective eating habits in infants and could promote and heighten the awareness the importance of hunger cues in long-term physical and emotional health in the infant (Reggiannini, 2013).

Theoretical Framework

The Health Promotion Theory designed by Nola Pender (2013) states that every individual has unique characteristics and life experiences that contribute to their decisions and actions. These variables affect behavior in a significant way. They can also be modified through nursing actions. The goal of the health promotion model is to promote healthy lifestyle behaviors resulting in improved health, functional ability, and quality of life throughout development. The last behavioral demand of the theory is to eliminate competing health demoting lifestyle choices and preferences. These actions can disrupt intended health promoting actions supported by the nurse (Nursing Theory, 2013).

This is an important theory to understand as a nurse because it tells us why humans make decisions, and how to work with patients to make better, health promoting decisions. Understanding a person's past experiences and preferences can explain their reasoning for their actions. When a patient is making an unhealthy life choice, nurses are responsible for educating

them on how to become healthy by supporting health-promoting behaviors (Nursing Theory, 2013).

The health promotion theory is directly correlated to this study. It is expected that educating new mothers about hunger cues of infants will increase their effectiveness of feedings, leading to longer feedings and a happier, healthier infants. Many women may not know when their infant is hungry just because they are not educated enough, or because they were inappropriately educated. Patient education by the nurse is necessary to promote bonding, the development of a trusting and healthy infant nutrition.

Methods

Design

This pilot study used a quasi-experimental pre-test/post-test to describe what new mothers knew about infant hunger cues and to determine the effect of an educational intervention on their awareness of hunger cues in infants. Enhanced awareness of hunger cues may lead to more effective feedings and health promotion in both new mothers and infants. Recruitment and data collection began after study approval from the university institutional review board (IRB).

Setting and Sample

Participants were recruited through the Le Leche League agency agency in the Midwest that provides support to women with infants. The convenience sample was comprised of mothers with infants who are currently using the services provided by La Leche League. Inclusion criteria included: 18 years of age and older, primipara and multipara mothers who have given birth in the past six months, were breast or bottle feeding, and had the ability to understand and speak English. No participants were excluded based on ethnicity as long as they meet the criteria above.

The co-investigators contacted the local La Leche league office to explore opportunities to use their center as a data collection site. Administrators at the La Leche league office granted consent to the co-investigators to recruit study participants at their site.

Sampling and Data Collection Procedures

To collect data for this pilot study, online surveys were used. Data collection began after getting information consent. Participants were asked to complete a demographic questionnaire and a pre-test survey with questions related to feeding infants. Demographic-information to be collected included age, ethnicity, prior experience with infants up to one year of age, parity, if they have received prenatal teaching/education, if they have previously breastfed, and education level. The pre-test survey also asked the client to list any hunger cues that they are aware of and how they would react to such cues. Examples of hunger cues were also given and mothers indicated if they have ever noticed these signals from their infant. The demographic questionnaire and pre-test survey took approximately 15 to 25 minutes to complete. After, the participants then received the intervention. The intervention consisted of a ten minute pre-recorded teaching session presenting early and late hunger cues. Following the intervention, participants were given the same survey they received at pre-test. All clients will be given the information they learned in a take-home pamphlet that was developed by the co-investigators (see Appendix F).

Each participant was assigned a code number and that code number was on the demographic questionnaire and the pre- and post-test surveys. All completed informed consent forms and surveys were stored in the project sponsor's locked university office and will be destroyed when the study is completed. Only the co-investigators and sponsor have access to study documents.

Intervention

The intervention consisted of a ten minute pre-recorded presentation that was made by the co-investigators. The presentation explained how to recognize early and late cues of hunger and how to know the difference. Also information on how to provoke certain hunger cues, like the rooting reflex, was explained during the presentation. The participants then received a pamphlet that contained the material reviewed during the intervention so they can take it home, refer to it, and apply to their actual lives. [Handouts and oral scripts are included in Appendix F and E]. It included many of the most commonly seen hunger cues and even how to provoke these signs, for example, the act of “rooting.” To motivate participants about the importance of recognizing these early hunger cues, research was provided to support the essentialness of creating healthy eating habits for infants. After the intervention and teaching has been conducted, participants had the opportunity to ask questions.

Measures

Knowledge and awareness of hunger cues was measured by using a survey developed by the co-investigators with a Likert scale of 1 to 4, with 1 being not confident, 2 = slightly confident, 3 = moderately confident, and 4 = very confident. For example, participants who have experience in caring for infants or have taken prenatal education classes may respond with a “4” when asked about their level of confidence with feeding their infant. On the other hand, a new mother who has not had prenatal teaching may respond at a “1” to that same question. All awareness items were summed and coded as Total Awareness. The psychometrics of our tool addressed the prior knowledge base that our client already had about feeding and hunger cues and their attitudes toward feeding.

Demographic data collected included: age, ethnicity, prior experience with infants up to

one year of age, parity, if they have received prenatal teaching/education and education level.

Data Analysis Plan

Data was entered into a software data analysis program (SPSS) and checked for completeness. Descriptive statistics were used to describe the sample and awareness of hunger cues. Dependent *t*-tests were used to determine differences in awareness pre-test and post-test means. Alpha levels of significance were set at 0.05.

Results

Demographics

The study included a total of 11 participants from the Le Leche League group. The majority of participants, 82%, were ages 30-35. The remaining women were in the category of 24-29 year age range. Caucasian/white was the most prevalent ethnicity with 8 participants who identified themselves in this category. Two women indicated they were African American and one participant identified herself as Hispanic. This study included nine mothers who identified themselves as “new moms”. Two mothers identified that this is not their first child. Eight mothers responded that their child is currently younger than 1 year old. The other three mothers indicated that their child is older than one year of age. Nine mothers have had prior childbirth or parenting classes. Ten mothers answered that they are exclusively breastfeeding and one mother answered that she is formula and breastfeeding. Three mothers had previous breastfeeding experience while the other eight mothers had no experience with breastfeeding. One mother responded that she practices timed feedings, eight mothers said they feed their baby when they think the baby is hungry, and two mothers do a combination of timed feeding and cued feeding.

Data Analysis

Mothers were asked before and after the intervention to identify which behaviors were

cues that their infant was hungry. In the pre-test, 55% of mothers answered that they believe their baby is hungry when they wake up. This result remained unchanged after undergoing the intervention with the post-test yielding the same result of 55%. 64% of mothers selected on their pretest that they believe their baby is hungry when sucking on their fingers. After the intervention, 100% of mothers then identified this as a hunger cue. 45% of women in the pre-test identified that they believe their baby is hungry when they lick their lips. There was an increase from 45% to 64% in the post-test in identifying the hunger cue of licking of the lips. The pre-test had 45% of mother who identified that they recognize that their baby is hungry when he or she becomes tense. There was an increase from 45% to 90% who recognized this hunger cue after the educational intervention. 45% of mothers recognized in the pre-test that their baby being fidgety is a sign of hunger. There was an increase of 45% to 91% who recognized this as a hunger cue in the post-test. 100% of mothers recognized in the pre-test the hunger cue of mouthing. An interesting decrease from 100% to 91% of recognition of mouthing was found in the post-test. 64% of participants saw crying as a hunger cue in the pre-test. An increase from 63% to 73% was found in the post-test in regards to crying as a hunger cue. One mother identified that an infant grabbing his or her feet was a hunger cue. In the post-test, 100% recognized that grabbing of the feet is not a hunger cue. All of the mothers recognized in the pre-test and the post-test that a dirty diaper and hiccups are not hunger cues.

The second half of the survey utilized the Likert scale to rate mothers' confidence in a variety of questions in regards to feeding and hunger recognition. The scale consisted of 1= not confident, 2=slightly confident, 3=moderately confident and 4=very confident. When mothers were asked about their confidence in knowing when their baby is hungry in the pre-test, 91% of mothers were at least moderately confident. One mother identified in the pre-test that she is only

slightly confident is recognizing when her baby is hungry. In the post-test, 100% of mothers identified that they were moderately confident in recognizing when their baby is hungry. When asked if mothers recognize certain cues that make them believe that their baby is hungry, 45% of women claimed in the pre-test that they were very confident. This number increased to 91% of mothers being very confident that they recognize certain cues of hunger in their baby. 100% of mothers in the pre-test and post-test were at least moderately confident in identifying the hunger cues of rooting. When mothers were asked about their confidence in knowing when their baby is done feeding, 1 was slightly confident, 4 moderately confident, and 6 very confident. In the posttest when asked the same question, 5 responded being moderately confident and 6 very confident.

Conclusion and Discussion

The table 1 (Appendix I) displays the calculated *t*-tests that represent the confidence levels of mothers' hunger cue knowledge before and after the educational intervention. Unfortunately the *t*-tests did not indicate any significant increase in confidence levels post intervention. Based on this pilot study, the confidence level concerning knowledge of hunger cues in new mothers did not show a significant increase after an educational video and flyer. However, the breast feeding support group of La Leche League regularly educates their members about caring for infants and understanding their needs. As a result, the pre-test confidence levels were very high, which may not be expected from mothers who had not received any prior education. A limitation of this study is the high level of knowledge the participants had prior to the study, which may have led to the educational intervention being less effective. A second limitation is that the co-investigators were unable to get a confirmed permission to conduct research with the Summit County Health Department Women Infant and Children's (WIC) office

in Akron.

This pilot study has potentially set a foundation for future nursing research to be studied in the area of intervention effectiveness. As nurses, it is important to evaluate the effectiveness of the teaching done with patients. If patients are taught vital information but do not retain it, they are at risk for a knowledge deficit that could have hazardous health outcomes. Future studies may be able to use the tools created in this study and could be used to evaluate a different population of women to compare effectiveness. The basis of this study could also initiate other nursing researchers to consider teaching and learning styles in regards to important healthcare information.

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Appendix A
Research ROL Summary Table

*Author(s), (Year). Title of article.	**Problem. Research Purpose &/or Research Question	Theoretical Framework What is it and how is it used?	Design of study ***Sample and sampling procedure	Variables and measures/tools. Reliability and validity of measures/tools	Findings Conclusions	Implications	****Limitations of findings
1 Hotelling, (2004). Newborn Capabilities: Parent Teaching is a Necessity. (p)(QUAL) (level X)	Communication of infant to parent is necessary in the development of a peaceful and healthy child. Can this be enhanced by educating parents on recognizing their infant's cues during the prenatal period?	The study references a quote by John Steinbeck in East of Eden (1952) that states that a child who experiences rejection of love and needs from the parent leads to feelings of anger, which leads to a life of crime, revenge, and guilt related to the crime.	Both male and female parents of childbearing age, race not specified, suggested taking Lamaze class.	Infant's Signals for Engagement and Disengagement table from The Journal or Perinatal Education, Reliable	The more informed a parent is about their child's communicating methods, the more they are able to provide appropriate care to that child, leading to a happier and healthier child. Parents need to take the time to learn their infants reactions to stimuli so that they can be properly attended to.	Journal implies that taking an education course such as Lamaze class, is necessary in understanding the communication of an infant. This understanding leads to acting as a more responsive parent and a happier and healthier child.	Does not clearly focus on a specific study, more informative of accumulated knowledge concerning hunger cues and the effects of understanding them.
2(p)(qual)Gross, Fierman, Mendelsohn, Chiasson, Rosenberg, Scheinmann, Messito (2010). Maternal Perceptions of Infant Hunger and Satiety (p)(qual) (level x)	---	The study looked at Latino mothers and assessed how parents respond to their baby's cry. This lead to the conclusion of pressure-feeding- forcing the baby to finish the entire bottle even when they are full.	Sample contained 368 mothers over 18 with a single infant under the age of 5 months who were enrolled at a local WIC clinic. Using logistic regression, assessment of the characteristics of associated with perception of cues and pressuring to feed were assessed.	Maternal perceptions, educations level of mothers, prior exposure to infants, difficult to determine consistency in reactions of mothers therefore affecting the reliability.	70% of mothers expressed that when a baby cries it means its hungry and not something else. 72% claimed that if an infant is crying it must mean hunger. 53% believe they should always make their baby finish their bottle.	This journal begins to associate infant crying, pressure feedings, and poor eating habits/obesity. This implicates that information and education about recognition of other hunger cues need to be assessed to ensure proper feeding to infants.	This study is limited to the urban Latino WIC clinic population. It may not be a generalizable to other populations because of cultural differences and socioeconomic differences.
3 Kandiah, Bunah, Amend, Teaching new mothers feeding cues may increase breastfeeding duration (2011). (p)(quant)(level VI)	Do mothers who receive extra education about hunger cues on average breastfeed for longer?	The framework consists of the approach that if mothers are given further information about hunger cues instead of just breastfeeding that they may feed for longer which is beneficial to the infant.	The sample was 197 women above the age of 18 who were clients at a WIC center of ethnically diverse backgrounds who received different forms of information and then were evaluated on length of time spent breastfeeding	Control group received basic feeding information, experimental group received information about hunger cues, Reliable method of sampling and evaluation.	Those who received further education of breastfeeding and hunger cues on average breastfed longer than those who received typical care.	Implications are that if mothers are exposed to education about hunger cues they may be at an increased advantage to breastfeed their baby longer which is beneficial for the infant.	The limitations are that it did not provide or explain what kind of supplemental intervention and education was provided to the group who received extra education.

4 Hodges, Fisher, Hopkinson, Hughes- Maternal Decision about initiation and termination of infant feeding (2007)(p)(qual) (level x)	Initiation and termination of feeding is understudied and may be a cause of overweight in infants because of accidental overfeeding which teaches unhealthy eating habits.	pilot study	71 ethnically diverse women with healthy children 3, 6 or 12 month infants qualitative study that questioned mothers about feeding initiation and termination	education level of women, age of women, prior exposure to children, intensity and variability in hunger cues	Mothers differ in the interpretation of hunger cues and thus different their interpretations when the infant is full and when to terminate feeding.	Intervention may be effective in this population so mothers can learn and become familiar with the most common hunger cues and signs of fullness that may promote recognition /enhanced control in further feedings	Population only looked at healthy children, very limited research on feeding children with poor health, does not address infants who are unable to produce hunger cues due to disability
5 Worobey, J. ,Lopez, M. , Hoffman,D. Maternal Behavior and Infant Weight gain in the first year (2009) (p) (QUAN) (level VIII)	To analyze and predict the trend of infant weight gain and maternal response to hunger cues over a year.	Gillman proposed that a mother who breastfeeds will be more responsive to her infants signs for frequency and volume for feeding and a mother who formula feeds may be less sensitive to these cues.	96 low income minority mother- infants dyads. at a WIC clinic. Longitudinal, multiple linear and backward linear progression to evaluate weight gain at 3,6, and 12 months of age.	Maternal BMI, education level, and weight gain during pregnancy , tools are quantitative and easy to evaluate.	Feeding plays a role in rapid weight gain. Scheduled feedings compared to cued feeding can consequently overfeed a child.	Educators working with low-income mothers need to provide guidance of feeding their infants by helping them recognize hunger and satiety cues.	This study only looked at mothers of low-income and did not extend to other classes so it may not be applicable to all populations.
6 Taveras, E., Ritas-Shiman, C., Scanlon K., Grummer-Straw, L., Sherry, B., Gillman, M.(2006)To what extent is the protective effect on breastfeeding on future overweight explained by decreased maternal feeding restriction? (p)(quan)(level VIII)	Does breastfeeding protect from overeating in infants and future over weight?	This study was based off of a cohort study model ,Project Viva , which measures breastfeeding duration time	The sample included 1012 mother-infant pairs and recorded the duration of feeding over 1 year. At 3 years of age, gender specific BMI and tricep skinfold thickness were recorded to determine overweightness	Can not indicate if other pathology occurs to cause obesity, formula of bottle fed babies is not recorded, environmental factors and physical activity and sleep have not been analyzed	The protective effects of breastfeeding can only be partially explained by decreased maternal feeding restriction.	Mothers who breastfeed may feed more effectively and promote health in their infant and avoid overweightness in their futures.	Many environmental factors can occur in life that cause obesity, different geographical location may yield other results, may only apply to americans and not other populations.
7 Breastfeeding and Infant Size (2013), Kramer, M., Moodie, E., Dahhou, M., Platt, R (p) (quan) (level VIII)	Do styles and methods of feeding affect infant growth?	The Promotion of Breastfeeding Intervention was followed analyzing the long-term effects of infant breastfeeding and was used as a comparison to their results.	the sample included over 17,000 infants who were born with a weight greater than 2500 grams at birth and tracked head circumference, weight and height over 12 months.	All infants were of Belarurian descent and data was collected years before results were published	It is impossible to correlate cause and effect relationship between breastfeeding and growth because of preexisting genetic and environmental factors.	Further research should be conducted to solidify the relationship between breastfeeding and growth and on other races and ethnicities before claiming a causative relationship	Research was only drawn from a specific ethnicity in a certain location. Study did not specifically indicate how feedings occurred, how often infants were fed, and how mothers reacted to their infants hunger. Article did not address environmental factors.
8 Reggiannini,	How do parents	---	infant is placed in	Infants	Parents who	Parents who	How a parent

<p>Sheinkopf, S., Silverman, H., Xiaoxue, L., & Lester, B. (2013), Assessment of Infant Cry (2013) (p) (qual)(level VIII)</p>	<p>perceive their infants cries and how does this affect the care that the parents will give the infant?</p>		<p>an isolette in a state of non-crying. Stimulation to the foot is applied and the infant cry is recorded for 10 seconds. Assessment is scored by software that analyzes the tone and consistency of the cry</p>	<p>perception of pain may vary, infants may have shaped behavior that elicits a different cry response, infant vocal cords may create different noises and sounds that register different acoustics</p>	<p>correctly identified their infants cry as aversive is attended to more urgently. The higher the cry, the more distress the infant is in (absolute hunger), and parent recognizes cue an emergent compared to lower sounds cries</p>	<p>correctly identify a cry and a cry of hunger and immediately recognize it as distressing to the infant (as of times of hunger) may recognize the infants need for food. Parental responses have not been recorded</p>	<p>reacts to certain cries has not been identified. If a parent were to recognize a "hunger" cry, they might respond by feeding infant. If a parent's first reaction to crying is feeding, they may be missing early signs of hunger in their infant therefore causing stress- this needs to be researched and identified to make this study complete.</p>
<p>9 Hodges, E., Johnson, L. Hughes, S., Hopkinson, J., Butte, N., Fisher, Development of responsiveness to child feeding cues scale (2013) (p) (qual)(level VIII)</p>	<p>The first 2 years of life are very influential on eating habits- how do parents help shape these habits and can they lead to poor habits/obesity?</p>	<p>Framework is based on Responsiveness to Childhood Feeding Cues Style, a measure of caregiver responsiveness to feeding relevant to obesity</p>	<p>144 ethnically diverse and health mothers of 7-24 year old infants- Parents were observed for 2 hours and were encouraged to feed the child as usual- a little or as often as they felt necessary and responses were recorded.</p>	<p>Group was ethnically diverse, mothers with prior knowledge (nutrition degree) were excluded to eliminate bias. All feedings that occurred and started within time period were recorded.</p>	<p>Mothers observed had higher recognition of hunger than of child fullness. Human nature is to defend body weight and to protect hunger</p>	<p>If parents do not recognize when and infant/child is full, it could promote overfeeding which could contribute to obesity</p>	<p>Cues were not described, method of feeding/substance of feeding was not stated, population was specific to those in the Houston Texas area.</p>
<p>10 Perceived Infant feeding restriction in a formula feeding world- The feeding your baby study (2013) (p) (qual) Lagan, B., Symon, A., Dalzell, J., Whitford, H.</p>	<p>Are pushes for exclusive breastfeeding conflicting mothers feeding habits because of mixed messages and disapproval of bottle feeding?</p>	<p>Ritchie and Lewis's five-stage analytic framework of familiarity, analyzing data, indexing and mapping responses to interpret the data.</p>	<p>seven focus groups (n=38) participated in semi-structured one-on-one interviews with mothers with a variety of feeding experiences</p>	<p>Variables included mothers of a variety of ages, races, education and life-experiences</p>	<p>Women received mixed messages in care and found they had inconsistent support. Women reported receiving different information from staff. Women wanted consistency and continuity in their information and advice</p>	<p>Members of the healthcare team who are taking care of a patient need to remain consistent in the information they are giving a mother about feeding to promote a trusting relationship and to promote consistent feeding styles. Clear guidance to healthcare professionals about providing feeding information is needed</p>	<p>Information is limited to Scotland and there is potential for cultural bias and differences. The length of postpartum time of mothers varied as well.</p>

*Indicate each: (a) Primary (P) or secondary (S) source: (b) Qualitative (QUAL), quantitative (QUAN), or mixed methods (MM). (c) Level of evidence (LOE)

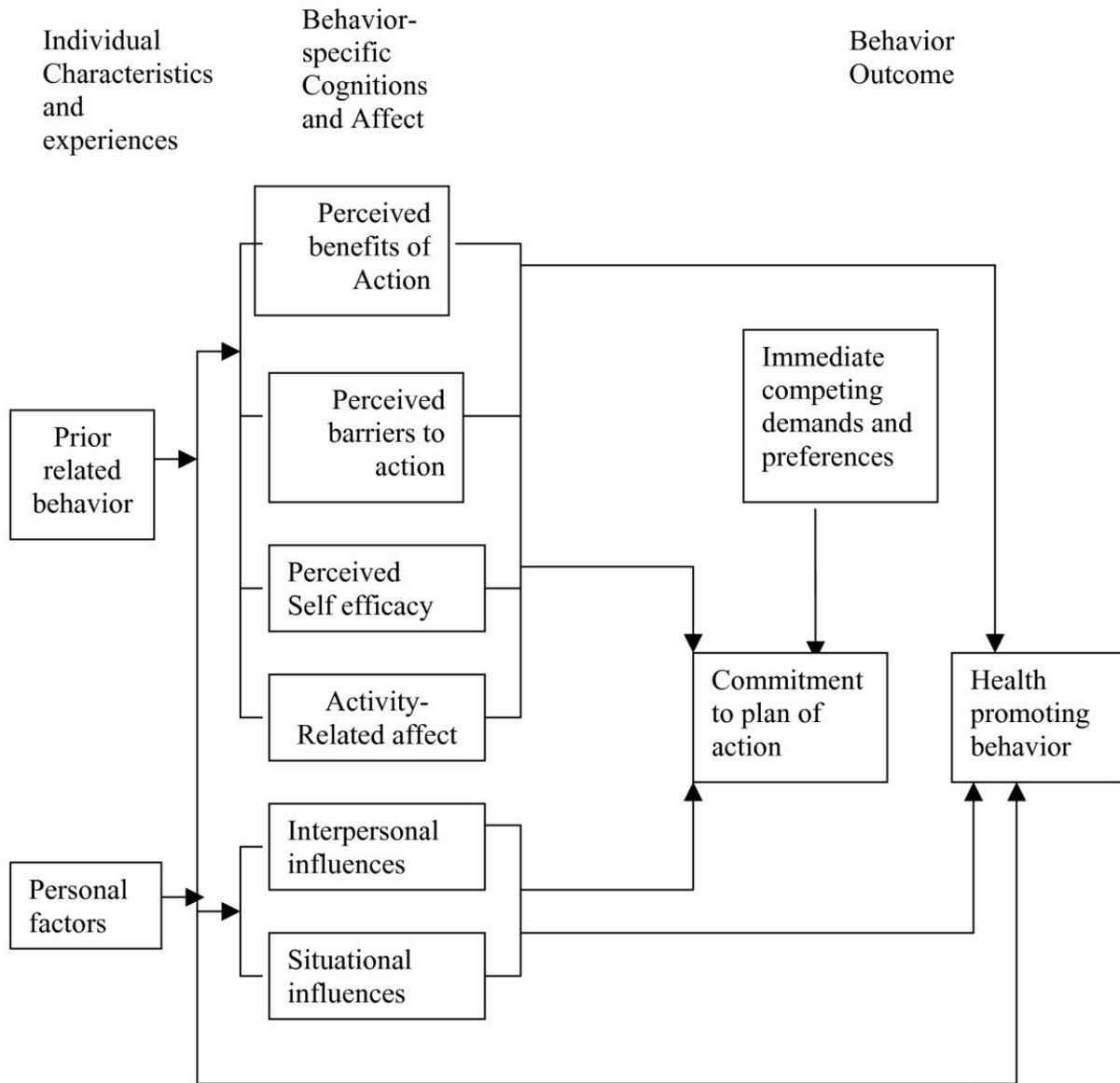
** Construct purpose statement and research question if not stated in article. Indicate independent variables, dependent variables, & population.

*** Include size, age, gender, ethnicity, other relevant sample characteristics, & sampling method.

**** Limitations, validity, and reliability of methods; applicability of findings. Consider Strengths, Weaknesses, Feasibility, Utility.

Appendix B

Pender's Health Promotion Theory



Appendix C

Demographic Questionnaire

Directions: Circle the response that best fits you.

Age: 18 - 23 24 - 29 30 - 35

Ethnicity: Caucasian/White African American/Black Asian Hispanic Other

Highest education level completed:

High School Some College Associate's Bachelor's Master's Doctorate

How many children do you have including this baby? _____

Is your baby one year old or younger? yes no

Before having this baby, have you taken care of a baby up to age 1: yes no

Have you had childbirth or parenting classes? yes no

Are you formula or breast feeding? Formula Breast Both

Have you previously breastfed? yes no

I feed my baby when: I think my baby is hungry At a certain time Both

Appendix E

CONSENT FORM**Introduction**

You are invited to participate in a research study being conducted by Ellen Vierheller and Juliana Gill, students in the School of Nursing, at The University of Akron. Taking part in research is voluntary. Please take time to read through this consent form and ask questions. This form provides a summary of the information Co-investigators will discuss with you.

Why is this research study being done?

This research study is being done to examine the effect of an educational hunger cues intervention on awareness. The following research question will be answered: Will new mothers who attend an educational intervention show increased awareness of hunger cues in their infants, in comparison to before the intervention? This study is being done in the fulfillment of a University of Akron Honors Nursing requirement.

We hope that educating mothers about the hunger cues displayed by their infant will increase confidence and awareness concerning feeding patterns and developing a trusting and effective relationship with the infant.

What is involved in the study?

If you agree to participate in this study, you will be asked to complete a short pre-test, listen to a 10 minute presentation by the co-investigators, and complete a short post-test. The questions in the pre- and post-test concern demographic information and your knowledge about hunger cues in your infant.

Identification information will be separated from survey information so no one will be able to link your survey responses to you personally. Your signed consent form will be kept separate from your information, and both the consent and information will be kept completely confidential and stored in a locked filing cabinet in the School of Nursing, at the University of Akron.

*If you have any questions or concerns about this study, you may call Dr. Christine Graor at 330-972-6422 or Dr. Michelle Enlow at 330-972-5938. This project has been reviewed and approved by the University of Akron Institutional Review Board.

I have read the information provided above and all of my questions have been answered to my satisfaction. I voluntarily agree to participate in this study and I will keep a copy of this consent for my records.

Participant Signature

Date

Appendix F

Educational Intervention Script

Hello. My name is Ellen Vierheller. And I am Juliana Gill. We are nursing students at The University of Akron. Thank you for joining us today and for taking part in our study about the knowledge of hunger cues in new moms. We would like to start by introducing the handout that is in front of you. This handout explains different hunger cues your baby may show. Hunger cues are signs your baby may show through sound or movement to tell you they are hungry. Examples of early hunger cues include sucking, rooting, mouthing, hands to mouth, fidgeting, and muscle tension such as closed fists and flexion of the arms.

Recognizing early cues is essential. Stirring is when your baby starts to make movements and signs of activity. Mouth opening: is when your baby makes mouthing movements, like opening and closing the mouth. Turning of the head or “rooting” is a little more tricky. But you can see this if you stroke your baby’s cheek, and he or she turns their face in the same direction as your finger. Your baby may also stretch a lot or have an increased in physical movement. Your baby may increasingly place hands and fingers in their mouth.

By the late stage of hunger, feeding becomes more difficult, because you must soothe and calm your baby first. Many people believe that when a baby cries that means he or she is hungry. This is true, but crying is a late sign of hunger. When your baby cries, attempt to settle the baby by holding and rocking bath and forth. Another late sign is agitated body movements. This is when your baby moves rigidly and activity will quickly increase. When your baby becomes frustrated from hunger, a change in color will be seen in the face.

Why is this important? Feeding your baby is a good way to establish bonding and trust. One way to establish a bond is through breastfeeding on demand or on cue. When your baby is hungry and show these early hunger cues, you may respond by feeding your baby. If you don’t, as time goes on, your baby will become hungrier until he or she is physically upset and crying. Once this happens, you may become stressed, which your baby can sense. This makes it harder to calm your baby down, which must be done before eating.

Thank you for listening and taking the time to learn about hunger cues in your baby. Please proceed by taking the post-test.

Appendix G

Education Intervention Informational Flyer

Recognizing Hunger Cues in Your Baby



Presented by Ellen Vierheller and Juliana Gill

**The University of Akron
School of Nursing**



(2012)

The Detection of early cues is essential...

Stirring: when your baby starts to initial make movements and signs of activity

Mouth opening: your baby makes mouthing movements, consistently opens and closes mouth

Turning head / Rooting: if you stroke your baby's cheek, he or she will turn their face in the same direction



(2012)

Stretching: straightening and lengthening body parts to their full length

Increased physical movement: activity enhances and becomes continually active

Hand to mouth: your baby will increasingly place hands and fingers in mouth



(2012)

By the late stage of hunger, soothe and calm your baby before attempting to feed.

Crying-when your baby cries, attempt to settle the infant by rocking and holding he or she

Agitated body movements- your baby will move rigidly and activity will quickly increase

Change in color-when your baby becomes frustrated from hunger, a change in color will be seen in the face

Appendix I

Table 1*Confidence Levels related to Mothers' Knowledge of Hunger Cues*

Variable	Pretest		Posttest		<i>t</i> Test	
	M	SD	M	SD	<i>t</i> (10)	p
Knowing when baby is hungry	3.5	.527	3.5	.527	0.00	1.000
Recognizing Hunger cues	3.5	.527	3.8	.422	1.964	.081
Have seen baby rooting	3.8	.422	3.7	.482	-1.000	.343
Have seen baby sucking on lips, fingers, etc. and will feed baby at that time	3.1	1.101	3.4	.966	1.406	.193
Know when baby is done feeding	3.4	.699	3.6	.516	1.500	.168

Note: Table 1 displays the calculated *t*-tests that represent the confidence levels of mothers' hunger cue knowledge before and after the educational intervention. Unfortunately the *t*-tests did not indicate any significant increase in confidence levels post intervention.