

DEVELOPMENT AND VALIDATION OF A SELF-EFFICACY THEORY-BASED  
INSTRUMENT TO MEASURE PRENATAL BREASTFEEDING  
SELF-EFFICACY AND BREASTFEEDING INTENTION  
AMONG PREGNANT WOMEN

by

ERIN MARIE MCKINLEY

LINDA L. KNOL, COMMITTEE CHAIR  
LORI W. TURNER, COMMITTEE CO-CHAIR  
JOY J. BURNHAM  
KRISTINE GRAETTINGER  
MARIA HERNANDEZ-REIF  
JAMES D. LEEPER

A DISSERTATION

Submitted in partial fulfillment of the requirements  
for the degree of Doctor of Philosophy  
in the Department of Health Science  
in the Graduate School of  
The University of Alabama

TUSCALOOSA, ALABAMA

2017

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## ABSTRACT

Breastfeeding is the feeding of a child with breast milk, either directly from the breast or by expression. Breastfeeding offers tremendous benefits to both the infant and mother. Individuals choose tasks they feel are within the boundaries of ability. The choice to engage in breastfeeding may be related to the level of self-efficacy a woman has to complete the task. Theoretical constructs have been operationalized to measure perceived self-efficacy for breastfeeding in pregnant populations; however, a guideline based, self-efficacy theory driven, valid, and reliable instrument is lacking. The purposes of this study were to create, test, and validate a new scale to measure prenatal breastfeeding self-efficacy, test the reliability of the scale, determine the correlation between prenatal breastfeeding self-efficacy and breastfeeding intention, and assess the differences in prenatal breastfeeding self-efficacy by the sociodemographic factors. One-hundred and twenty-four pregnant women, 18 years or older, participated in this cross-sectional study. All participants completed the survey and any interested participant took a second retest reliability survey home to complete and mail back to the researcher. Confirmatory factor analysis did not confirm the proposed model; therefore, an exploratory factor analysis was conducted to examine the construct validity using maximum likelihood factor analysis with varimax rotation. This revealed a valid ( $\alpha=.980$ ) and reliable ( $r=0.920$ ) four factor questionnaire for total prenatal breastfeeding self-efficacy – The Prenatal Rating of Efficacy in Preparation to Breastfeed (PREP to BF) Scale. Total PREP to BF score was significantly correlated to breastfeeding intention ( $r=.615$ ;  $P<.001$ ). Women who had at

least some college education ( $P=.003$ ), were currently married ( $P=.027$ ), had breastfed previously ( $P=.035$ ), and planned to deliver vaginally ( $P=.043$ ) had significantly greater PREP to BF scores than their counterparts. Measuring the level of breastfeeding self-efficacy at the prenatal stage could alert prenatal women and health professionals to particular individual skill sets needed to successfully initiate breastfeeding after birth. A strong understanding of which pregnant women may or may not be at risk for non-initiation of breastfeeding may help healthcare professionals create and provide the most appropriate support to their patients.

## LIST OF ABBREVIATIONS

<i>BF</i>	Breastfeeding
<i>BMI</i>	Body Mass Index
<i>BPEBI</i>	Breastfeeding Personal Efficacy Beliefs Inventory
<i>BSES</i>	Breastfeeding Self-efficacy Scale
<i>BSES-SF</i>	Breastfeeding Self-efficacy Scale – Short Form
<i>FHLC</i>	Fetal Health Locus of Control Scale
<i>HIV</i>	Human Immunodeficiency Virus
<i>IFI</i>	Infant Feeding Intentions
<i>IIFAS</i>	Iowa Infant Feeding Attitudes Scale
<i>IRB</i>	Institutional Review Board
<i>NGSE</i>	New General Self-efficacy Scale
<i>NIS</i>	National Immunization Survey
<i>OB/GYN</i>	Obstetrics and Gynecology
<i>PREP to BF</i>	Prenatal Efficacy in Preparation to Breastfeed Scale
<i>PBSES</i>	Prenatal Breastfeeding Self-efficacy Scale
<i>SE</i>	Self-efficacy
<i>SNAP</i>	Supplemental Nutrition Assistance Program
<i>US</i>	United States of America
<i>WIC</i>	Supplemental Nutrition Program for Women, Infants, and Children

## ACKNOWLEDGEMENTS

I am grateful to have this opportunity to thank all my committee members, Dr. Linda Knol, Dr. Lori Turner, Dr. Joy Burnham, Dr. Kristy Graettinger, Dr. Maria Hernandez-Reif, and Dr. James Leeper for their expertise, positive feedback, and encouragement throughout this dissertation. I would especially like to thank my co-chairs, Dr. Linda Knol and Dr. Lori Turner for their unwavering support and guidance throughout the entire process. I would also like to thank to staff of the Obstetrics and Gynecology clinic at the University Medical Center at The University of Alabama for their support and assistance throughout the data collection period.

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## CHAPTER 1

### INTRODUCTION

Breastfeeding is the feeding of a child with breast milk, either directly from the breast or by expression and fed by bottle or cup.<sup>1</sup> Terms that will be discussed include exclusive breastfeeding, the feeding of a child with no other liquid or solid other than breast milk and complimentary feeding, feeding a child a combination of breast milk, other liquids, semi-solid, and solid food.<sup>2</sup> Exclusive breastfeeding should not extend past the first six months of life when complimentary feeding is necessary for proper infant development.<sup>3</sup> The common recommendation across many organizations is to recommend to new mothers exclusive breastfeeding for the first six months of an infant's life with continued breastfeeding with complimentary foods to one year or longer.<sup>4-9</sup>

Breastfeeding offers tremendous benefits to the infant including optimal nutrition, strong bonding with the mother, safe and fresh milk, enhanced immune system, and promotion of correct development of jaw and teeth. Breastfeeding also helps to reduce infant risk for gastroenteritis, asthma and severe lower respiratory tract infections, allergies and intolerances, chronic disease such as obesity and diabetes, and infant morbidity and mortality. Mothers benefit from breastfeeding through strong bonding with the infant, increased energy expenditure leading to faster return to pre-pregnancy weight, time saved from preparing formula, money

saved from not buying formula, and possible decreased medical expenses for the child.

Breastfeeding mothers may also experience decreased risk for diabetes, breast cancer, and postpartum depression.<sup>8,10</sup>

In spite of known benefits, current rates of breastfeeding do not meet Healthy People 2020 objectives. Among babies born in 2013 in the United States, 81.1% were ever breastfed, 44.4% were exclusively breastfed for at least the first three months, and 22.3% were exclusively breastfed for at least the first six months of life. Healthy People 2020 objectives state goals of 81.9%, 46.2%, and 25.5% respectively.<sup>11</sup>

Common barriers to breastfeeding include a lack of knowledge of the benefits of breastfeeding and the risks of not breastfeeding,<sup>12</sup> the inability to overcome or cope with breastfeeding challenges,<sup>13,14</sup> comfort with formula feeding,<sup>15</sup> and negative views of breastfeeding of the mother's partner, family, or friends.<sup>16,17</sup> Other barriers include fear of breastfeeding in public or in front of other people,<sup>18</sup> pre-pregnancy overweight or obesity,<sup>19</sup> the need to return to work shortly after birth,<sup>20,21</sup> returning to a workplace without adequate breastfeeding accommodations,<sup>22</sup> and a lack of confidence in the ability to breastfeed.<sup>23</sup> Young age, a low level of education, low income, and being single have also been found to be deterrents to breastfeeding initiation.<sup>23-26</sup>

### *Self-efficacy and Self-efficacy Theory*

Individuals tend to choose tasks they feel are within the boundaries of ability. The level of competence a person may have in performing and managing a given task is directly associated with level of confidence for the task. Self-efficacy is the ability to make effective decisions and to take responsible action based upon one's own needs and desires.<sup>27</sup> Self-efficacy theory<sup>28</sup> states that people generally choose to attempt tasks they believe they can accomplish and avoid

tasks in which they believe they may fail. A strong sense of efficacy is an indication that a person believes they can accomplish a difficult task, viewing it as a challenge to be mastered and not a threat to avoid.<sup>29</sup> The four antecedents that must occur before self-efficacy can be sensed include mastery experience, vicarious experience, verbal persuasion, and physiological cues.<sup>28,30</sup> Three underlying attributes of self-efficacy are affective processes, including beliefs in capabilities and management of threats, cognitive processes, including goal setting and visualization of success, and locus of control, a persons' perception of what controls the events in their life – destiny or personal effort.<sup>31,32</sup>

### *Breastfeeding Self-efficacy*

Positive feelings of excitement or satisfaction that may arise from preparing for breastfeeding may contribute to a mother having a higher level of breastfeeding self-efficacy.<sup>33</sup> Breastfeeding self-efficacy is not only measured on the beliefs of one's ability to breastfeed, but the ability to mentally manage ones confidence, stress and problem solving skills with regard to breastfeeding. A mother's confidence to breastfeed may be the deciding factor of whether or not she is successful in initiating and continuing breastfeeding to her desired duration.<sup>34</sup> Much of the early literature focused on breastfeeding self-efficacy is not theory based and does not investigate confidence in the ability to prepare to breastfeed in the prenatal period.<sup>17,33,35-41</sup>

### *Measurement of Breastfeeding Self-efficacy*

The available breastfeeding self-efficacy instruments were validated to measure self-efficacy at different points in the postpartum period<sup>42-44</sup> and the available prenatal instruments are weak in design and not widely utilized in current literature.<sup>45,46</sup> Despite the high reliability of the six available scales to measure breastfeeding self-efficacy, the instruments have not been independently validated for use among groups of women at both the prenatal and postpartum

time frames. Using the current instruments, without alteration, would be inappropriate to measure levels of prenatal breastfeeding self-efficacy because the scale items are not worded to reflect perceived efficacy for present factors when the actual behavior is not taking place yet. Most of the items ask about confidence with events and issues that would only happen after birth when actually engaging in breastfeeding activity. A strong need exists for a self-efficacy theory-based, valid, and reliable instrument to assess prenatal breastfeeding self-efficacy and breastfeeding intention in pregnant populations.

### *Purpose of the Study*

The purpose of this study was to develop and validate a self-efficacy theory-based instrument to measure prenatal breastfeeding self-efficacy and predict breastfeeding intention among a sample of pregnant women. Accomplishing this purpose involved three stages: (a) the identification and operationalization of scale items that conceptually reflected self-efficacy theory in relation to breastfeeding self-efficacy among pregnant women, (b) the creation of new scale items that directly reflected self-efficacy theory in relation to the domains of prenatal breastfeeding self-efficacy, and (c) the validation of the developed scale items. A validated, reliable, theory-based instrument could be used in the future to evaluate the effectiveness of prenatal breastfeeding programs or prenatal breastfeeding self-efficacy specific interventions and further align education and promotion strategies with the theoretical framework.

### *Research Questions*

The research questions concern the validity and reliability of the instrument (questions 1 and 2), the predicative validity and reliability of the instrument to predict breastfeeding self-efficacy

(question 3), and the relationships between each personal factor, each antecedent and attribute of self-efficacy theory, and prenatal breastfeeding self-efficacy (question 4). The following are the research questions for this study:

1. Is the instrument a valid measure of prenatal breastfeeding self-efficacy as intended by the combined constructs of performance accomplishment, vicarious experience, verbal persuasion, physiological cues, cognitive process and affective processes?
2. Does the instrument measure prenatal breastfeeding self-efficacy consistently across survey data collection periods?
3. Do the combined subscales of performance accomplishment, vicarious experience, verbal persuasion, physiological cues, cognitive process and affective processes predict breastfeeding intention among pregnant women?
4. Are there significant differences in breastfeeding self-efficacy and its components by the personal factors of the model? (breastfeeding exposure, demographics, return to work, mode of delivery, pre-pregnancy body-mass index (BMI))

### **Independent and Dependent Variables**

Demographic information such as age, race, ethnicity, marital status, education, participation in The Supplemental Nutrition Program for Women, Infants, and Children (WIC), Supplemental Nutrition Assistance Program (SNAP), or Medicaid, and current employment were collected. Independent variables including height, pre-pregnancy weight, stage of pregnancy, parity, planned mode of delivery, previous breastfeeding, plan to return to work or school, and breastfeeding education exposure were assessed. Additional variables that were measured include cognitive processes such as goal setting and visualization of success, affective processes including emotional reactions and beliefs, locus of control, and antecedents of self-efficacy

including performance accomplishments, vicarious experience, verbal persuasion, and physiological cues. The dependent variables were the measure of breastfeeding intention and the sum total score of prenatal breastfeeding self-efficacy using a self-efficacy scale created specifically for this investigation.

### **Assumptions**

Assumptions for the study were as follows:

1. Self-efficacy attributes and antecedents towards breastfeeding occur on a continuum.
2. Certain behaviors and personal factors distinguish women with high breastfeeding self-efficacy from those with lower breastfeeding self-efficacy.
3. Participants in the study responded truthfully and thoughtfully.

### **Delimitations**

Delimitations for the study are as follows:

1. The study population was limited to adult women 18 to 50 years of age.
2. Each participant was pregnant throughout the entire duration of study.
3. Participant exclusion criteria: 1) under 18 years of age, 2) pregnancy with multiples.

### **Limitations**

Limitations of this study were as follows:

1. Potential misinterpretation of instrument items by the participants.
2. Convenience sampling of current patients of the OB/GYN clinic at the University Medical Center at The University of Alabama. Not all pregnant women had the opportunity to participate in the study.

3. Cross-sectional study design limited information to only one point in time for each of the participants.
4. Inherent limitations of self-efficacy theory.

### **Significance of the Study**

A strong need exists for a self-efficacy theory-based, valid, and reliable instrument to assess prenatal breastfeeding self-efficacy and predict breastfeeding intention. A validated, theory-based instrument could be used in the future to evaluate the effectiveness of prenatal breastfeeding programs or interventions based on self-efficacy theory. An instrument that measures breastfeeding self-efficacy in a prenatal population that properly considers each attribute and antecedent of self-efficacy theory may help to create a functioning model of prenatal breastfeeding self-efficacy. The model could also be used to explain differences in breastfeeding intention in different populations. Future prenatal breastfeeding interventions and programs that are rooted in self-efficacy theory may be better evaluated with a more appropriate, theory-based scale.

### **Definitions of Terms**

The following are operationalized definitions for this study:

*Affective Processes:* as part of self-efficacy theory, “the emotional reactions that can affect action, both directly and indirectly, by changing the thought process and is dependent on how well people think they can cope.”<sup>32</sup> People who believe they can manage threats are less concerned with them. People can lower their stress and anxiety by exercising control over the potential threats.<sup>47</sup>

*Braxton hicks:* contractions that are intermittent uterine contractions that start in early pregnancy that can be confused with early preterm labor.<sup>27</sup>



*Breastfeeding*: the child is receiving breast milk (direct from the breast or expressed).<sup>1</sup>

*Breastfeeding duration*: the length of time an infant is breastfed from the initial feed to the last feed with breast milk.<sup>2</sup>

*Breastfeeding initiation*: initial provision of mother's breast milk to an infant shortly after birth.<sup>3</sup>

*Breastfeeding self-efficacy*: the concept of a mother's confidence level in her ability to breastfeed her child and her ability to manage tasks associated with breastfeeding.<sup>43</sup>

*Breast milk substitute*: any food or formula being marketed or otherwise presented as a partial or total replacement for breast milk.<sup>48</sup>

*Cognitive Processes*: as part of self-efficacy theory, people "set high goals, commit to challenges that are more difficult, and strive to meet those goals. A person achieves the goals by visualizing successful outcomes instead of dwelling on the potential negative consequences."<sup>32</sup>

*Complimentary feeding*: the feeding of both human milk and solid or semi-solid food to a child between 6 and 23 months of age.<sup>2</sup>

*Exclusive breastfeeding*: the feeding of mother's milk as an infant's only food source. Babies included in this category may be receiving oral rehydration solution, vitamins and minerals, and/or other oral medications, but may not receive any other foods or fluids.<sup>2</sup>

*Galactose*: a simple sugar that is a portion of lactose; the sugar present in milk.<sup>2</sup>

*Galactosemia*: congenital metabolic disorder causing inability of the body to use the simple sugar galactose, causing accumulation of galactose 1-phosphate in the body, which results in damage to the liver, central nervous system, and other body systems with permanent, even fatal outcomes.

*Gestational diabetes*: a type of diabetes, or difficulty of the pancreas to control blood glucose levels, diagnosed during pregnancy.<sup>27</sup>

*Gestational hypertension*: diagnosed during pregnancy when blood pressure levels are above the normal range.<sup>27</sup>

*Hand expression*: the release of milk from the breast with the use of one's own hands.<sup>2</sup>

*Health Behavior Theory*: "a set of interrelated concepts, definitions, and propositions that present a systematic view of events or situations by specifying relations among variables in order to explain and predict events or situations."<sup>49</sup> From a health education and promotion perspective, "the term *theory* is used to represent an interrelated set of propositions that serve to explain health behavior or provide a systematic method of guiding health promotion practice."<sup>50</sup>

*Human milk substitute*: another term used to describe liquid food provided to a child that is not breast milk. Also known as infant formula.<sup>2</sup>

*Human t-cell lymphotropic virus type I and II*: family of viruses that are a group of human retroviruses that are known to cause a type of cancer called adult T-cell leukemia or lymphoma. Also called human T-cell leukemia.<sup>51</sup>

*Infant formula*: a breast milk substitute formulated industrially in accordance with applicable Codex Alimentarius standards, to satisfy the normal nutritional requirements of infants up to between four and six months of age, and adapted to their physiological characteristics. Infant formula may also be prepared at home, in which case it is described as "home-prepared."<sup>48</sup>

*Lactation*: the period of milk secretion from the breasts.<sup>51</sup>

*Locus of control*: one's belief regarding one's personal power over life events.<sup>52</sup>

*Mastery experience:* previous success accomplishing something that is similar to the new behavior.<sup>53</sup>

*Mastitis:* inflammation in the breast causing localized tenderness, redness, and heat. Mother may have a fever; feel tired, achy, or nauseous; or have a headache. Mastitis may or may not be an infective process.<sup>2</sup>

*Multiparous:* a woman who has given birth to more than one baby.<sup>2</sup>

*Multiples pregnancy:* a pregnancy with more than one baby at the same time (twins, triples, quadruplets, etc.).<sup>27</sup>

*Otitis media:* is any inflammation of the middle ear, without reference to etiology or pathogenesis.<sup>27</sup>

*Parity:* the number of previous deliveries experienced by a woman.<sup>27</sup>

*Physiological cues:* the emotional and physical states that arise thinking about taking on the new behavior.<sup>53</sup>

*Placenta previa:* when the placenta is lying unusually low in the uterus, next to or covering the cervix. If the placenta remains dangerously low as the pregnancy progresses, it can cause bleeding, which can lead to other complications and may require early delivery.<sup>27</sup>

*Postpartum:* following childbirth or the birth of the young.<sup>27</sup>

*Preeclampsia:* when a pregnant mother has a combination of high blood pressure and protein in the urine or liver or kidney abnormalities after 20 weeks of pregnancy.<sup>27</sup>

*Nulliparous:* a woman who is giving birth for the first time.<sup>2</sup>

*Rooming-in:* the practice followed in hospitals where the newborn infant's crib is kept by the side of the mother's bed throughout the duration of the hospital stay.<sup>2</sup>

*Self-efficacy*: the ability to make effective decisions and to take responsible action based upon one's own needs and desires.<sup>27</sup>

*Self-efficacy Theory*: health behavior theory that proposes people will generally only attempt things they believe they can accomplish and will avoid things they feel they may not be successful with.<sup>28</sup>

*Theory of Planned Behavior*: Ajzen and Fishbein<sup>54</sup> developed the theory of reasoned action, which proposes that the basis of behavior derives from the concept *intention*. Ajzen<sup>55</sup> later developed by the Theory of Planned behavior by adding the construct perceived behavioral control. Other constructs include attitudes and subjective norms.

*Verbal persuasion*: words of encouragement in regard to the new behavior received from other people.<sup>53</sup>

*Vicarious experience*: learning by watching someone similar to self be successful at something.<sup>28</sup>

*Weaning*: discontinuation of breastfeeding and substitution of food or infant formula for breast milk.<sup>27</sup>

## CHAPTER 2

### DEVELOPMENT AND PSYCHOMETRIC TESTING OF THE PRENATAL RATING OF EFFICACY IN PREPARATION TO BREASTFEED SCALE AMONG PREGNANT WOMEN: AN INSTRUMENT FOR BREASTFEEDING SELF-EFFICACY DURING THE PRENATAL PHASE

Breastfeeding offers tremendous benefits to the infant including optimal nutrition, safe and fresh milk, enhanced immune system, and promotion of correct development of jaw and teeth. Breastfeeding also helps to reduce infant risk for gastroenteritis, asthma and severe lower respiratory tract infections, allergies and intolerances, chronic disease such as obesity and diabetes, and infant morbidity and mortality. Mothers benefit from breastfeeding through strong bonding with the infant, time saved instead of preparing formula, money saved from not buying formula, and possible decreased medical expenses for the child. Breastfeeding mothers may also experience decreased risk for diabetes, breast cancer, and post-partum depression.<sup>1,2</sup>

The American Congress of Obstetricians and Gynecologists,<sup>3</sup> the American Academy of Pediatrics,<sup>4</sup> the Academy of Nutrition and Dietetics,<sup>2</sup> the American Academy of Family Physicians,<sup>5</sup> the Academy of Breastfeeding Medicine,<sup>6</sup> and the United States Breastfeeding Committee<sup>7</sup> recommend that new mothers breastfeed exclusively for the first six months of an infant's life with continued breastfeeding with complimentary foods to one year or longer. In spite of known benefits, current rates of breastfeeding do not meet Healthy People 2020 objectives. Among babies born in 2013 in the United States, 81.1% were ever breastfed, 44.4%

were exclusively breastfed for at least the first three months, and 22.3% were exclusively breastfed for at least the first six months of life. Healthy People 2020 objectives state goals of 81.9%, 46.2%, and 25.5% respectively.<sup>8</sup>

Breastfeeding self-efficacy, as well as breastfeeding intention, are two modifiable factors that have an effect on rates of breastfeeding initiation.<sup>9,10</sup> Maternal breastfeeding confidence (self-efficacy) is an important factor influencing breastfeeding duration, as well.<sup>11</sup> Prenatal women with low confidence are more likely to discontinue breastfeeding in the first week postpartum compared to women with higher self-confidence.<sup>12</sup> Measuring and understanding the factors that are influencing breastfeeding intention and self-efficacy in the prenatal period may enhance prenatal education programs and ultimately improve breastfeeding rates.

#### *Self-efficacy Theory*

Self-efficacy theory<sup>13</sup> helps to explain the choosing and maintaining of health behaviors. The theory proposes that people will generally only attempt behaviors they believe they can accomplish and will avoid the behaviors where they will not be successful. Bandura theorized that people with a high level of self-efficacy believe they can accomplish difficult tasks and see them as challenges to master and not threats to avoid. Self-efficacy theory proposes that self-efficacy is influenced by four main antecedents: performance accomplishment, vicarious experience, verbal persuasion, and physiological responses. Key attributes of self-efficacy theory also include cognitive processes such as goal setting and visualization of success, affective processes such as beliefs and emotions, and locus of control.<sup>14</sup> Generally, people must believe they will perform a new behavior successfully in order for performance to actually occur. A

mother deciding to breastfeed must not only understand the benefits of breastfeeding, but must also believe she can do so successfully.<sup>15</sup> Preparation in the prenatal period is key to building confidence through the constructs of self-efficacy theory.

Performance accomplishment, or mastery experience, is achieved through the successful completion of tasks that are similar or related to breastfeeding a child. Completion of prenatal breastfeeding classes, support groups, workshops, or speaking with a health professional or lactation counselor may help to increase knowledge, positive attitudes, and mastery of introductory skills, such as holding a baby to breast or recognizing infant feeding cues.<sup>16</sup> A mother who has previously breastfed a child would have mastery experience of the actual behavior, which may lead to high self-efficacy for breastfeeding the next child.<sup>17</sup>

Vicarious experience gained in the prenatal period may have an influential effect on breastfeeding self-efficacy. Seeing or watching other women breastfeed, especially those who appear to look similar, has led to more positive attitudes about breastfeeding in samples of women in several studies.<sup>18-20</sup> Seeing other women breastfeed can start at an early age if a woman was raised in a breastfeeding home or had opportunities to view other family members and friends breastfeed their infants.<sup>21</sup> Viewing others model breastfeeding behaviors and in turn replicating what one is seeing also helps to gain mastery experience. The influence of other persons and children in the household may affect the attitudes and beliefs a woman has about breastfeeding. Expressed negative opinions about breastfeeding by the child's father,<sup>22-24</sup> the mother's partner, the family, or friends may dissuade a mother to choose breastfeeding over bottle feeding.<sup>25-27</sup> Mothers with less breastfeeding experience are more likely to seek out

information and advice about breastfeeding from significant others.<sup>16,28</sup> Positive verbal persuasion to pursue and prepare for breastfeeding from other people may increase a woman's confidence and self-efficacy to breastfeed her child.<sup>15</sup>

Physiological responses, such as the current emotional and physical state, including the presence of any stress, anxiety, fatigue, pain, or depression may influence a mother's attitude about infant feeding and how she evaluates her ability to breastfeed. Individual stress or anxiety may stem from thoughts about keeping up with the demand of breastfeeding, the desire to have one's body back to oneself after birth, current lifestyle choices, and the need to return to work or school.<sup>29,30</sup> Through the combination of obtaining mastery experience, viewing others engage in breastfeeding, and having positive verbal persuasion from others may help to alleviate stress, anxiety, depression or fear associated with initiating breastfeeding.<sup>15</sup> Prenatal factors may affect breastfeeding self-efficacy that are related to the antecedents of self-efficacy include: fear of failure,<sup>31</sup> uncertainty of what to expect,<sup>32,33</sup> lack of observational learning opportunities,<sup>33,34</sup> previous negative breastfeeding experience,<sup>35</sup> limited availability of professional breastfeeding support,<sup>32</sup> and low level of breastfeeding knowledge.<sup>36</sup>

Cognitive processes of self-efficacy theory are engaged through visualizing success and setting goals to be successful with breastfeeding. Affective processes include having belief in one's ability to breastfeed and having a plan to manage threats that may arise throughout the pregnancy which may affect the decision to breastfeed. Increased assurance to overcome possible threats or barriers, as well as, higher confidence in performing the act of breastfeeding has been positively associated with intention and initiation of breastfeeding.<sup>37</sup> Locus of control, with regard to breastfeeding, represents a woman's belief that either fate, or her own personal power over the events in her life, may affect the child's health and the ability to breastfeed her



child. These beliefs stem from each of the environments she has contact with during the pregnancy. The main environment is centered on the mother herself and those closest to her. Perceived locus of control over the health of the baby may stem from belief of powerful others, or fate, or from the belief that she is in control of the outcome of the pregnancy. High, internal fetal health locus of control, or a high sense that a mother has strong personal control over the health of the unborn baby, has been shown to be significantly associated with higher rates of breastfeeding intention and initiation.<sup>38</sup>

Perceived self-efficacy for every behavior cannot be measured with one universal self-efficacy instrument. Efficacy beliefs for different behaviors are multifaceted under the umbrella of the antecedents and attributes of self-efficacy theory. The behavior in which self-efficacy is to be measured must be analyzed to reveal relevant domains of functioning – what behavioral factors exist that one would encounter in preparing to take on the new behavior? Including factors that are not related to the current state of the behavior, (e.g., possible future situations after the behavior is initiated) that one cannot judge in the present (due to not currently acting out the behavior), will lessen any predictive relationship between the relevant factors and the intention to perform that behavior.<sup>39</sup>

Several theory-based instruments used to measure infant feeding attitudes, confidence, breastfeeding intention, and specifically breastfeeding self-efficacy have been created and validated for use among various female populations.<sup>34,40-44</sup> Dennis and Faux<sup>34</sup> validated the Breastfeeding Self-efficacy Scale (BSES) to assess breastfeeding self-efficacy in postpartum women with a sample of postpartum, breastfeeding mothers in Canada. In 2003, Dennis<sup>41</sup> reduced the original 32-item scale to the 14-item Breastfeeding Self-efficacy Scale – Short Form (BSES-SF). The Prenatal Breastfeeding Self-efficacy Scale (PBSES) was developed to measure

breastfeeding self-efficacy among prenatal women. The scale was initially based on the four attributes of self-efficacy theory, but failed to assess each attribute adequately. Two of the factors ask the mother to report her future confidence in dealing with breastfeeding techniques or barriers. Items addressing vicarious experience, locus of control, and the cognitive and affective processes are not part of this instrument.<sup>44</sup> Thus, there is a need to create a scale that contains items that measure all of the constructs of self-efficacy theory. The purpose of this current study was to develop a scale to measure prenatal breastfeeding self-efficacy using six constructs of self-efficacy theory, test its psychometric properties, determine internal consistency and reliability, and assess any correlation between prenatal breastfeeding self-efficacy and breastfeeding intention.

## **Methods**

### *Participant Recruitment*

Participants were recruited from a convenience sample of 395 patients from the Obstetrics and Gynecology (OB/GYN) clinic at the University Medical Center on the campus of The University of Alabama (UA). Participants needed to be older than 18 years of age to participate in the study, but could be of any race, ethnicity, or stage of pregnancy. Exclusion criteria included females who were under 18 years of age and any female with a pregnancy with multiples (e.g., twins, triples, etc.). The survey was only available in English, thus, pregnant women who did not speak English were not eligible to participate. The institutional review boards at UA and within the College of Community Health Science approved this study to be completed at the OB/GYN clinic at the University Medical Center on the campus of UA in the spring of 2017.

### *Data Collection*

Data collection took place over seven weeks in March and April, 2017. Participants were recruited for the study while waiting for scheduled appointments with their physician at the OB/GYN clinic. The primary investigator approached women in the waiting area and provided the study information via a study flyer. If the woman was interested and met the study criteria, then the primary investigator obtained informed consent and the participant completed the survey. All participants who completed the survey were given \$5 cash incentive for participation. All interested participants could take a second retest reliability survey home to complete and mail back to the researcher. Participants who returned the retest survey and provided an email address were entered into a drawing to win one of ten \$25 retail gift cards.

### *Instrument*

Participants completed an 88-question survey measuring general self-efficacy, fetal health locus of control, breastfeeding intention, prenatal self-efficacy for breastfeeding, and demographic information. The demographic section of the survey inquired about: age, due date, height, pre-pregnancy weight, race/ethnicity, rank in school, current work status, plan to return to work after childbirth, enrollment in government assistance programs, marital status, intended method of delivery, previous childbirth, previous breastfeeding experience, and exposure to breastfeeding information. Previously validated questionnaires were used to address general self-efficacy<sup>45</sup> and fetal health locus of control.<sup>46</sup>

Breastfeeding intention was measured with three questions adapted from Francis and colleagues<sup>47</sup> guidelines on formatting a scale to measure general intention to engage in a behavior based on the Theory of Planned Behavior. The questions asked about participant's intention to breastfeed after birth with each question beginning with either the phrase "I expect

to,” “I want to,” or “I intend to breastfeed.” Adequate internal consistency has been demonstrated using the three items in this way to measure intention for various behaviors.<sup>48</sup> The three questions utilized a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7).

The 39 items on the prenatal breastfeeding self-efficacy scale were developed following a review of the literature on breastfeeding, breastfeeding self-efficacy, self-efficacy scale creation, and previously created breastfeeding self-efficacy scales. The constructs of self-efficacy theory,<sup>13</sup> as defined by Bandura and the guidelines<sup>39</sup> for constructing proper questions and scales to measure self-efficacy for a behavior, were utilized to design the scale items. Initially six subscales reflecting the constructs of self-efficacy theory were included – performance accomplishment (6 items), vicarious experience (5 items), verbal persuasion (10 items), physiological cues (7 items), cognitive processes (5 items), and affective processes (6 items). The scale utilized a 10-point response scale, ranging in 1-unit intervals from 0 (“Cannot do”); through 5 (“Moderately can do”); to 10 (“Highly certain can do”). Respondents were asked to rate how confident they were with each scale item “as of right now” to reflect their present level of perceived self-efficacy for preparing to possibly engage in breastfeeding behavior after giving birth. A total prenatal breastfeeding self-efficacy score was calculated for each participant from the answers to the 39 questions creating a possible score range from 0 to 390.

A five-member panel of experts from the fields of breastfeeding, self-efficacy survey scale design, and health behavior theory completed a two-round review of the instrument for face and content validity prior to administration. The expert panel received evaluation forms containing all of the instrument questions with universal and operational definitions for each self-efficacy construct. For each item, the panel answered the following questions: “is the item

readable,” “are the endpoints adequate,” and “is the item face valid” as “Yes or No.” At the end of each subscale of questions, they were asked to select “Yes or No” to answer the question, “do the items fit under this construct as operationally defined?” After the first round of review, appropriate revisions were made and the panel was sent the updated instrument with a second evaluation form. Changes were made to the wording of the breastfeeding intention question set to include less wording for easier reading. Panel members also felt that items asking about family members needed a note to include both the mother’s family and her partner’s family. Item wording throughout the self-efficacy scale was adjusted as to not lead women toward a particular answer and to be very clear on the first read of the question. At the conclusion of the second round, face and content validity of the questions and constructs was affirmed by all five members of the panel.

A pilot test of the instrument’s readability, comprehensibility, and completion time was conducted among a sample of five women from the study population. A revision was made to the wording of one demographic question to include more precise answer choices. Completion time of the survey packet ranged from 11 to 20 minutes total. Data from the pilot surveys were not included in the statistical analyses of this study.

#### *Data Analysis*

Internal consistency of the prenatal breastfeeding self-efficacy scale was assessed through Cronbach’s alpha. Confirmatory factor analysis (CFA) was performed to analyze if the scale questions fit the appropriate self-efficacy theory constructs as written. The CFA did not confirm the proposed model, therefore an exploratory factor analysis (EFA) was conducted to examine the construct validity using maximum likelihood factor analysis with varimax rotation. Cronbach’s alpha scores for the resulting factors were calculated to assess the validity of each

factor. Bivariate correlations using Spearman's rank correlation were calculated between the model factors, between prenatal breastfeeding self-efficacy score and each of the individual factors, and to assess the correlation between the overall prenatal breastfeeding self-efficacy score and breastfeeding intention. Statistical analyses were conducted using Statistical Package for the Social Sciences (SPSS) version 24 and SPSS AMOS version 24 for Windows. Alpha level was set as  $\alpha = .05$  for all analyses.

## **Results**

### *Demographics*

A total of 395 women were approached, and 145 (36.7%) women were fully qualified to participate in the study. Women were denied the opportunity to participate if they were not pregnant or under the age of 18 at the time of data collection. Of those who were eligible to participate, 133 (91.7%) completed the survey on site. Nine surveys (6.7%) were excluded from the analyses due to incomplete survey data. On average, the participants were 26.2 years  $\pm$  4.68 years with a range of 18 to 38 years. As illustrated in Table 1, a higher percentage of the women were African-American (55.6%), unmarried (66.1%), and in their third trimester of pregnancy (49.2%). Thirty eight percent (38.7%) of the participants had completed some college education, while 16.1% held a Bachelor's degree or higher. A third of the women (33.1%) indicated their current pregnancy would be their first child. Among the women who had children already (n=82), 58.5% indicated they had prior experience breastfeeding a child. The majority (76.6%) of the women indicated they would return to work within the first year after childbirth, with 25.2% of those women listing a maternity leave time of 12 weeks or more. Sixty three percent (63.7%) of the women indicated they either agreed or strongly agreed with the statements

regarding intention to breastfeed after delivery. The participants had a mean prenatal breastfeeding self-efficacy score of 299.5 with a range of 0 to 390. Age nor parity were related to breastfeeding intention or prenatal breastfeeding self-efficacy score.

**Table 1.** Study Sample Characteristics.

<b>Characteristic</b>	<b>n</b>	<b>Percent of Sample</b>
<b>Race (n=124)</b>		
Non-Hispanic white	55	44.4%
Non-Hispanic black	69	55.6%
<b>Age (n=124)</b>		
18 – 25	53	42.7%
26 – 38	71	57.3%
<b>Education (n=123)</b>		
Less than high school	20	16.3%
High school diploma	35	28.4%
Some college	48	39.0%
Bachelor’s degree or higher	20	16.3%
<b>Marital Status (n=121)</b>		
Single	82	67.7%
Married	39	32.3%
<b>Parity (n=123)</b>		
Nulliparous	41	33.3%
Multiparous	82	66.7%
<b>Trimester (n=121)</b>		
First	16	13.2%
Second	44	36.3%
Third	61	50.5%
<b>Breastfeeding Experience (n=123)</b>		
Yes	48	39.1%
No	75	60.9%
<b>Breastfed as a Child (n=122)</b>		
Yes	36	29.5%
No	57	46.7%
Unsure	30	23.8%
<b>Planned Mode of Delivery (n=120)</b>		
Vaginal	97	80.8%
Caesarian (C-Section)	23	19.2%

<b>Characteristic</b>	<b>n</b>	<b>Percent of Sample</b>
Pre-pregnancy BMI (n=118)		
Under and Normal (< 18.5 – 25.0)	52	44.0%
Overweight (25.1 – 30.0)	30	25.4%
Obese classes I-III (30.1 – > 40.1)	36	30.6%
Return to work within 1 year (n=123)		
Yes	95	77.2%
No	28	22.8%

### *Internal Consistency and Reliability*

The internal consistency of the 39-item prenatal breastfeeding self-efficacy scale was measured using Cronbach's alpha. Cronbach's alpha for the scale was .980 with an item-to-total correlation range of 0.536 to 0.784, indicating that all items were adequately correlated to the entire scale. After a test-retest analysis, the Cronbach's alpha for the scale was .973, indicating the scale is reliable when used again over time.

### *Factor Analysis*

Confirmatory factor analysis was performed to determine whether the scale questions fit the appropriate self-efficacy theory constructs as written. A model of the six constructs of self-efficacy theory and the corresponding questions written under the definition of each construct was drawn in SPSS AMOS version 24. The chi-square totaled 2445.09 with 687 degrees of freedom ( $P < .001$ ) indicating the model did not fit as intended. Other indicators confirmed that the model did not fit. Goodness of fit index (GFI) was computed as 0.480, whereas a desirable GFI is  $\geq .90$ . The root mean square error of approximation (RMSEA) was 0.144, whereas a desirable RMSEA is  $\leq .05$ . The normed fit index (NFI) was 0.641, whereas a desirable NFI, similar to GFI, should be  $\geq .90$ .

Exploratory factor analysis was then conducted to examine the construct validity using maximum likelihood factor analysis with varimax rotation. Among the 39 instrument items,



there were four factors extracted with an eigenvalue of 1.00 or greater. The first factor explained 59.53% of the variance with the four factors explaining a total of 74.05% of the variance. The item loadings were all above 0.412, which presents evidence to the construct validity for the instrument, therefore all 39 questions were retained in the model. Table 2 contains the Cronbach's alpha of each factor as well as descriptive statistics and standardized factor loadings for each scale question.

The underlying dimensions identified by each factor are as follows: I) Individual Processes, II) Interpersonal Processes, III) Professional Advice, and IV) Social Support. Fourteen items loaded on the factor "Individual Processes" (eigenvalue = 23.22) representing self-confidence in many cognitive processes, such as overcoming fear, stress, and anxiety while understanding the difficulty breastfeeding may pose. Items related to other cognitive processes, such as goal setting and mental preparation to breastfeed, also loaded on this first factor. The 16 items that loaded on the factor "Interpersonal Processes" (eigenvalue = 2.53) were related to comfort with talking about breastfeeding and accepting advice about breastfeeding from friends and family. Items related to observing and imitating other mothers' breastfeeding (modeling) also loaded on this factor. The four items that loaded on the factor "Professional Advice" (eigenvalue = 1.876) assessed confidence in the ability to seek and follow professional advice. The five items that loaded on the final factor "Social Support" (eigenvalue = 1.25) assessed social support for friends and family. Factor 1, individual processes, had a Cronbach's alpha of .977. Factor 2, interpersonal processes, had a Cronbach's alpha of .955. Factor 3, professional advice, had a Cronbach's alpha of .944. Factor 4, social support, had a Cronbach's alpha of .851.

**Table 2.** Descriptive Statistics and Standardized Factor Loadings for a Maximum Likelihood Analysis with Varimax Rotation (n=124).

<b>Construct and Variables*</b>	<b>Mean (SD)</b>	<b>Standardized Loadings</b>
<b>Individual Processes (14 items)</b>		
Overcome any anxiety you may feel about breastfeeding?	7.81 (3.16)	0.837
Manage your time so you can breastfeed?	7.78 (3.12)	0.837
See yourself as a breastfeeding mother?	7.78 (3.38)	0.822
Manage the possible challenges that may come with breastfeeding?	8.17 (3.00)	0.790
Commit to breastfeeding your baby?	7.69 (3.36)	0.778
Visualize yourself being successful at breastfeeding?	8.23 (2.90)	0.751
Mentally prepare yourself to breastfeed your baby?	8.06 (3.13)	0.722
Overcome any stress you may feel about breastfeeding?	8.01 (2.83)	0.686
Accept that breastfeeding takes time?	8.33 (2.62)	0.684
Set goals for yourself to be successful at breastfeeding your baby?	8.39 (2.92)	0.631
Solve problems that may keep you from breastfeeding your baby?	8.06 (2.80)	0.592
Accept that breastfeeding will not always be easy?	8.50 (2.66)	0.574
Overcome any fear you may feel about breastfeeding?	8.26 (2.53)	0.551
Accept others opinions (positive or negative) about breastfeeding?	8.01 (2.83)	0.491
<b>Interpersonal Processes (16 items)</b>		
Discuss breastfeeding with other mothers or pregnant women?	7.76 (3.17)	0.776
Ask another breastfeeding mother questions about breastfeeding?	7.91 (3.04)	0.704
Talk about breastfeeding with your close friends?	7.79 (3.29)	0.689
Accept advice about breastfeeding from those who are not friends, family, or a health care provider?	6.03 (3.65)	0.668
Talk about breastfeeding with those who are not friends, family, or a health care provider?	6.40 (3.58)	0.665
Explain the benefits of breastfeeding to another person?	7.41 (3.21)	0.650
Explain how to breastfeed a child to another person?	6.51 (3.59)	0.639
Accept advice about breastfeeding from close friends?	8.05 (2.85)	0.631
Imitate another woman breastfeeding a baby (using a doll or other prop)?	6.46 (3.55)	0.628
Obtain opportunities to watch other women breastfeed?	5.51 (3.69)	0.604
Locate breastfeeding support in your community?	7.06 (3.33)	0.594
Talk about breastfeeding with family members?	7.80 (3.27)	0.564
Accept advice about breastfeeding from your partner?	7.74 (3.04)	0.544
Obtain opportunities to watch other women, who look like you, breastfeed?	5.90 (3.68)	0.530

<b>Construct and Variables*</b>	<b>Mean (SD)</b>	<b>Standardized Loadings</b>
Talk about breastfeeding with your partner?	8.65 (2.73)	0.463
Accept advice about breastfeeding from family members?	8.11 (2.91)	0.453
<b>Professional Advice (4 items)</b>		
Talk about breastfeeding with your health care provider?	8.81 (2.50)	0.691
Accept advice from your health care provider about breastfeeding?	8.78 (2.46)	0.669
Find the answers to your questions about breastfeeding?	8.54 (2.74)	0.640
Gather information to help you make a decision about breastfeeding?	8.15 (2.90)	0.577
<b>Social Support (5 items)</b>		
Depend on your friends to support decisions you make about infant feeding?	7.06 (3.53)	0.741
Count on your family to support the decisions you make about infant feeding?	8.00 (3.15)	0.737
Count on your family to support the decisions you make about your baby?	7.97 (3.25)	0.636
Depend on your friends to support the decisions you make about your baby?	6.54 (3.96)	0.598
Handle friends or family that do not support breastfeeding?	7.40 (3.49)	0.412

\*All questions began with the root: "Thinking about your life right now, how well can you..."

### *Model of Prenatal Breastfeeding Self-Efficacy*

The items that loaded with each factor were summed and an average factor score with a possible range of 0 to 10 was calculated. Fourteen participants completed and returned the retest survey. Data were tested for normality by performing a Shapiro-Wilk test that indicated the data were not normal ( $P < .001$ ). Spearman's rank correlations between the mean factor scores were computed. Each factor's test and retest means were highly and significantly correlated. Table 3 summarizes the descriptive statistics and test retest reliability of each factor in the model.

**Table 3.** Test Retest Reliability and Descriptive Statistics of Model Factors.

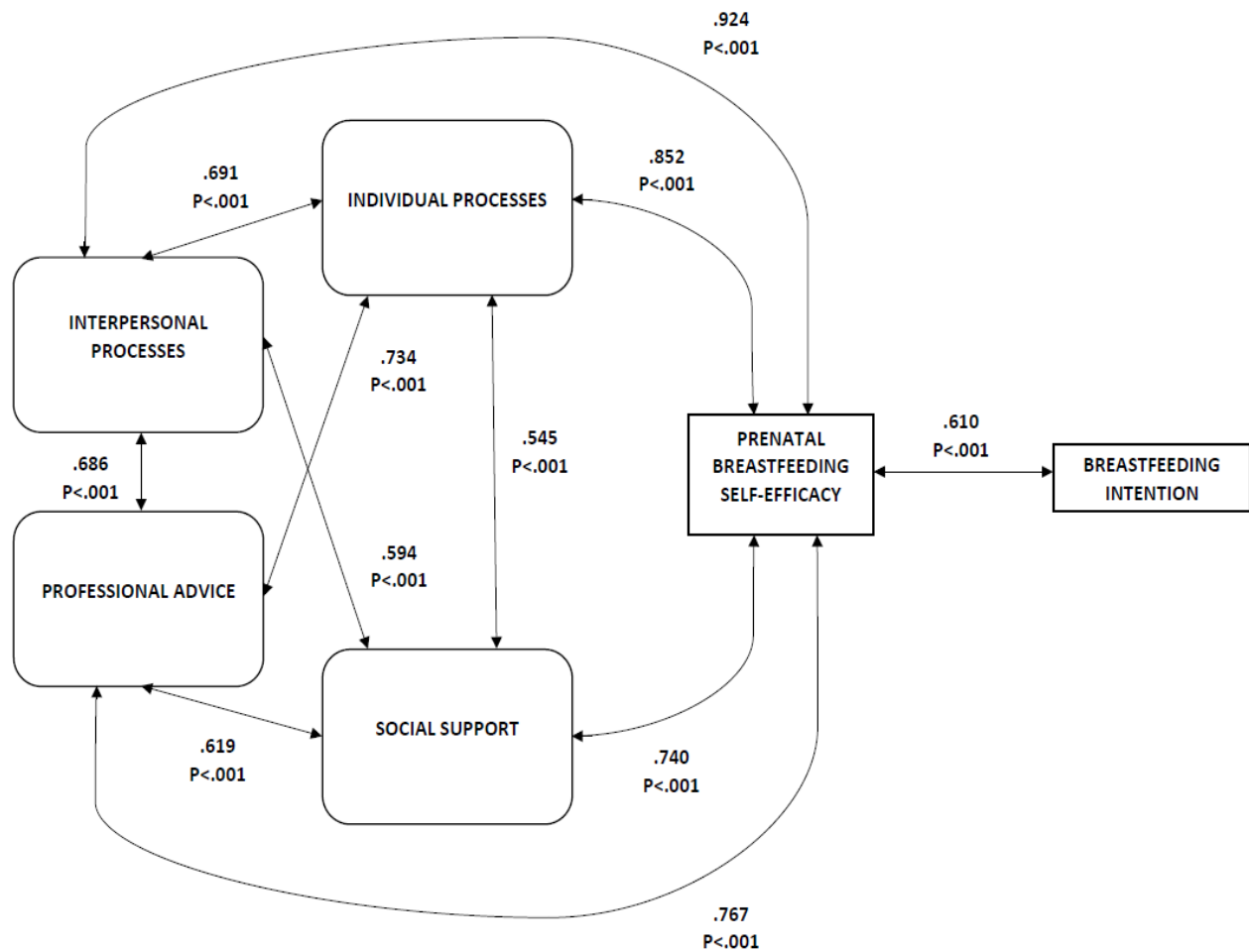
<b>Factor</b>	<b>Test Score</b>	<b>Retest Score</b>	<b>Correlation<sup>a</sup></b>	<b>P</b>
	<b>Mean (SD) (n=14)</b>	<b>Mean (SD) (n=14)</b>		
Individual Processes	8.08 (2.61)	9.20 (1.88)	0.883	<.001*
Interpersonal Processes	7.19 (2.55)	8.01 (1.95)	0.893	<.001*
Professional Advice	8.57 (2.45)	8.96 (1.82)	0.919	<.001*
Social Support	7.39 (2.76)	8.20 (2.06)	0.880	<.001*

<sup>a</sup>Spearman's rank correlation was used to determine the reliability of each questionnaire factor.

\*indicates a significant difference between groups.

Bivariate correlations using Spearman's rank correlation for non-normal data were completed to assess the correlations between each of the factors to one another, each of the factors to the total prenatal breastfeeding self-efficacy score, and breastfeeding intention and self-efficacy score. Figure 1 is a diagram of the resulting model of prenatal breastfeeding self-efficacy with the correlations and level of significance. All factors were highly and significantly correlated to one another, as well as, highly and significantly correlated to total prenatal breastfeeding self-efficacy score. Breastfeeding intention and total prenatal breastfeeding self-efficacy score were also highly and significantly correlated (.610,  $p < .001$ ).

**Figure 1.** Model of Breastfeeding Self-efficacy Among Pregnant Women in the Prenatal Phase.



## Discussion

The Prenatal Rating of Efficacy in Preparation to Breastfeed (PREP to BF) Scale is a valid and reliable measure of self-efficacy toward breastfeeding during the prenatal period. The survey items were derived from empirical literature on breastfeeding self-efficacy and current available instruments to measure self-efficacy. Confirmatory factor analysis did not confirm the initial model but did confirm a model that revealed four key areas of preparation that influence breastfeeding self-efficacy in the prenatal period. The internal consistency of the questionnaire, at both test and retest periods, was well above the desired criterion of .80 alpha for new

instruments.<sup>49</sup> After an exploratory factor analysis, the resulting four factors in the final model were highly and significantly correlated to one another. The new instrument is related to breastfeeding intention in this sample of pregnant women. This finding is consistent with previous prenatal breastfeeding self-efficacy studies that found those women who had the intention to breastfeed having significantly higher self-efficacy scores than women who indicated they did not intend to breastfeed.<sup>33,44</sup>

The four key areas, or factors, of individual processes, interpersonal processes, professional advice, and social support are not all reflected as factors in previously validated scales to measure breastfeeding self-efficacy. While other breastfeeding self-efficacy scales<sup>34,40,41,44</sup> emphasize breastfeeding knowledge, technique, and problem solving, this scale focuses on the internal and interpersonal factors, as well as available support systems needed to make the decision to breastfeed prior to delivery. Questions from the individual processes factor of this scale assess a woman's confidence in her ability to overcome emotions associated with breastfeeding such: as fear, stress, and anxiety, her confidence with overcoming possible barriers, and setting goals for success. The previously validated prenatal breastfeeding self-efficacy scale<sup>44</sup> has a factor that assessed demands of breastfeeding and overcoming barriers, but the barriers were all related to events that would happen during the postpartum period, such as using a breast pump and breastfeeding while upset. The PREP to BF scale has an interpersonal processes factor that assesses multiple elements of information seeking, verbal discussion about breastfeeding, and accepting advice about breastfeeding from friends, family, and/or strangers. The scale also assesses a woman's confidence in her ability to seek out and understand breastfeeding information, discuss breastfeeding with a health professional, and accept the advice provided from those discussions through a specific professional advice factor. The

previous prenatal self-efficacy scale<sup>44</sup> had similar questions related to talking to a health professional or calling a lactation counselor, but did not assess the woman's understanding or accepting of the advice. Social support items are assessed on this survey as well as the other prenatal self-efficacy scale. The items on the PREP to BF scale assess social support from the point of view of measuring confidence in ability to obtain support and handling friends and family that do not support breastfeeding. The previous prenatal scale only assessed confidence in a woman's ability to choose to breastfeeding despite a lack of support from the partner and family.<sup>44</sup> The PREP to BF scale items acknowledge possible negativity from friends and family, but also assess confidence in being able to depend on the positive support she may receive.

The items on this self-efficacy scale were written to the specifications for instruments to measure self-efficacy set forth by Albert Bandura.<sup>39</sup> Unlike previously validated scales to measure prenatal breastfeeding self-efficacy, the items in this scale only ask the pregnant mothers to assess their self-efficacy for activities and thought processes they can complete while pregnant. The items do not ask women to project their self-efficacy to future activities such as the actual act of breastfeeding, pain management, or unexpected problems. Thus, the resulting score from this questionnaire reflects prenatal self-efficacy prior to delivery and may represent the elements needed to feel confident in one's ability to make the decision to breastfeed. The items on this self-efficacy instrument assess multiple barriers to breastfeeding initiation including: level of social support, ability to locate breastfeeding support and information, overcoming stress, fear, and anxiety, and communicating with friends, family, and health professionals about breastfeeding. Research has shown that women who lack support, trust, or confidence in these areas are less likely to initiate breastfeeding.<sup>22,50-54</sup> Early assessment and interventions to assist pregnant mothers with these crucial aspects of infant feeding may assist

mothers in making the decision to breastfeed or to further commit to the intention to breastfeed, both ultimately leading to initiation after birth.

On average, participants in this study seemed to score high (averages scores of seven or higher) in the individual processes, suggesting that this group of women may be intrinsically motivated when it pertains to aspects they have total control over, such as their own thoughts and feelings about breastfeeding and the ability to set and commit to personal goals. The participants were all patients of an OB/GYN clinic that openly supported breastfeeding, and were actively maintaining scheduled appointments during pregnancy. This may help to explain the high mean scores on the professional advice survey items. Research has shown the positive effect of encouragement to breastfeed from health professionals on breastfeeding attitudes and outcomes of the patients.<sup>55</sup> Items with low scores were found in the interpersonal and social support scales. These scores may suggest that the women in this study need to obtain opportunities to watch other women breastfeed, and talk with others about breastfeeding. These scores may also suggest the need for the women to open the discussion about an infant feeding decision to partners, friends, and family to aid in assurance of the choice to breastfeed. The clinic did not have a lactation counselor or peer breastfeeding educator on staff for patients to engage in open discussion with or answer specific breastfeeding questions. Research has shown the positive effects of exposure to a peer educator or lactation counselor on rates of breastfeeding initiation and exclusive breastfeeding.<sup>56-58</sup>

The current study had several limitations including the use of a convenience sample of pregnant woman at one OB/GYN clinic in the southeastern United States. Although the study recruited a small sample size of women, consisting of only black and white women who spoke English, the sample represented 1/3 of the active pregnant patients of the clinic. Results from



this study cannot be generalized to a larger population of ethnically diverse, pregnant women in other healthcare settings. Data collection for the study took place over 3 to 6 hours of clinic time on most days of the week, but the researcher was not present during all clinic hours. Often the clinic required patients to complete paperwork pertaining to their current visit or to be established as a patient, which limited the amount of time some women were available to be screened by the researcher. Patients were also not approached as they were exiting clinic appointments. All of these instances may have affected the number of participants recruited for the study. Future studies should ensure a researcher is on site throughout all clinic hours and attempt to screen all patients either before or after they complete their clinic visit. Although the researcher was available to clarify any items and answer questions, potential misinterpretation of instrument items by the participants may have occurred. The study itself being cross-sectional in design contributes to its own limitation of measuring the participant's confidence in the factors and total prenatal breastfeeding self-efficacy at one point in time in the pregnancy. The study is unable to draw any predictive conclusions about breastfeeding intention or breastfeeding self-efficacy.

### **Implications for Research and Practice**

This study found a new, valid, and reliable instrument for measuring breastfeeding self-efficacy in the prenatal period. The instrument may be used by both clinicians and researchers to measure a prenatal woman's self-efficacy as well as reveal areas the mother may need to address such as goal setting skills or overcoming barriers before she gives birth to ensure she commits to her decision to initiate breastfeeding. Results from this study suggest that the prenatal breastfeeding self-efficacy a pregnant woman has is highly correlated to her level of breastfeeding intention. Women with higher breastfeeding self-efficacy also had higher

breastfeeding intention, and vice-versa. Educational programs are needed aimed at increasing pregnant mothers' confidence through goal setting, overcoming barriers, increasing comfort with breastfeeding, and developing communication skills to properly discuss breastfeeding with health professionals, family, and friends.

Future research should investigate the relationship between prenatal breastfeeding self-efficacy and breastfeeding intention with a valid measure of breastfeeding knowledge and skills. Additionally, because this study did not measure the participants' postpartum breastfeeding behavior, future studies should use a longitudinal design to investigate whether the instrument scale is predictive of breastfeeding initiation, duration, and exclusivity. Measuring the level of prenatal breastfeeding self-efficacy could alert prenatal women and health professionals to specific, individual skill sets needed to successfully initiate breastfeeding after birth.

## References

1. Lawrence RM, Lawrence RA. Breastfeeding: more than just good nutrition. *Pediatr Rev/AAP*. 2011;32(7):267-280.
2. Lessen R, Kavanagh K. Position of the academy of nutrition and dietetics: promoting and supporting breastfeeding. *J Acad Nutr Diet*. 2015;115(3):444-449.
3. Committee on Health Care for Underserved Women. ACOG Committee Opinion No. 361: Breastfeeding: maternal and infant aspects. *Obstet Gynecol*. 2007;109(2 Pt 1):479-479.
4. Eidelman AI, Schanler RJ, Johnston M, et al. Breastfeeding and the use of human milk. *Pediatrics*. 2012;129(3):e827-e841.
5. American Association of Physicians (AAFP). Breastfeeding, family physicians supporting (position paper). *Leawood, KS: AAFP*. 2008.
6. Chantry CJ, Eglash A, Labbok M. ABM Position on Breastfeeding—Revised 2015. *Breastfeeding Med*. 2015;10(9):407-411.
7. United States Breastfeeding Committee. Statement of Exclusive Breastfeeding. 2015; <http://www.usbreastfeeding.org/p/cm/ld/fid=22>. Accessed May 9, 2017.
8. Healthy People 2020. 2015; <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=26>. Accessed May 9, 2017.
9. Dennis CL, Heaman M, Mossman M. Psychometric testing of the breastfeeding self-efficacy scale-short form among adolescents. *J Adolesc Health*. 2011;49(3):265-271.
10. Stuebe AM, Bonuck K. What predicts intent to breastfeed exclusively? Breastfeeding knowledge, attitudes, and beliefs in a diverse urban population. *Breastfeeding Med*. 2011;6(6):413-420.
11. O'Campo P, Faden RR, Gielen AC, Wang MC. Prenatal factors associated with breastfeeding duration: recommendations for prenatal interventions. *Birth*. 1992;19(4):195-201.
12. Buxton KE, Gielen AC, Faden RR, Brown CH, Paige DM, Chwalow AJ. Women intending to breastfeed: predictors of early infant feeding experiences. *Am J Prev Med*. 1991;7(2):101-106.
13. Bandura A. Self-efficacy. In, VS Ramachaudran, ed. *Encyclopedia of Human Behavior*. New York, NY: Academic Press: 1994:71-81.

14. Zulkosky K. Self-efficacy: a concept analysis. Paper presented at: Nursing Forum 2009.
15. Dennis CL. Theoretical underpinings of breastfeeding confidence: A self-efficacy framework. *J Hum Lact.* 1999;15(3):195-202.
16. Kloeblen-Tarver AS, Thompson NJ, Miner KR. Intent to Breast-Feed: The Impact of Attitudes, Norms, Parity, and Experience. *Am J Health Behav.* 2002;26(3):182-187.
17. Hackman NM, Schaefer EW, Beiler JS, Rose CM, Paul IM. Breastfeeding outcome comparison by parity. *Breastfeeding Med.* 2015;10(3):156-162.
18. Connolly C, Kelleher CC, Becker G, Friel S, Gabhainn SN. Attitudes of young men and women to breastfeeding. *Irish Med J.* 1997;91(3):88-89.
19. Fitzpatrick C, Fitzpatrick P, Darling M. Factors associated with the decision to breast-feed among Irish women. *Irish Med J.* 1994;87(5):145-146.
20. Greene J, Stewart-Knox B, Wright M. Feeding preferences and attitudes to breastfeeding and its promotion among teenagers in Northern Ireland. *J Hum Lact.* 2003;19(1):57-65.
21. Hoddinott P, Kroll T, Raja A, Lee AJ. Seeing other women breastfeed: how vicarious experience relates to breastfeeding intention and behaviour. *Matern Child Nutr.* 2010;6(2):134-146.
22. Atchan M, Foureur M, Davis D. The decision not to initiate breastfeeding -- women's reasons, attitudes and influencing factors -- a review of the literature. *Breastfeeding Rev.* 2011;19(2):9-17.
23. Bar-Yam NB, Darby L. Fathers and breastfeeding: a review of the literature. *J Hum Lact.* 1997;13(1):45-50.
24. Littman H, Medendorp SV, Goldfarb J. The Decision to Breastfeed The Importance of Fathers' Approval. *Clin Pediatr.* 1994;33(4):214-219.
25. Grassley J, Eschiti V. Grandmother breastfeeding support: what do mothers need and want? *Birth.* 2008;35(4):329-335.
26. Pilkauskas N. Breastfeeding initiation and duration in coresident grandparent, mother and infant households. *Matern Child Hlth J.* 2014;18(8):1955-1963.
27. Raj VK, Plichta SB. The role of social support in breastfeeding promotion: a literature review. *J Hum Lact.* 1998;14(1):41-45.
28. Kessler LA, Gielen AC, Diener-West M, Paige DM. The effect of a woman's significant other on her breastfeeding decision. *J Hum Lact.* 1995;11(2):103-109.

29. Lee HJ, Rubio MR, Elo IT, McCollum KF, Chung EK, Culhane JF. Factors associated with intention to breastfeed among low-income, inner-city pregnant women. *Matern Child Hlth J.* 2005;9(3):253-261.
30. Ogbuanu CA, Probst J, Laditka SB, Liu J, Baek J, Glover S. Reasons why women do not initiate breastfeeding: a southeastern state study. *Women's Health Iss.* 2009;19(4):268-278.
31. Bowles BC. Promoting breastfeeding self-efficacy: Fear appeals in breastfeeding management. *Clin Lact.* 2011;2(1):11-14.
32. Moore ER, Coty MB. Prenatal and postpartum focus groups with primiparas: breastfeeding attitudes, support, barriers, self-efficacy, and intention. *J Pediatr Health Car.* 2006;20(1):35-46.
33. Robinson KM, VandeVusse L. African American women's infant feeding choices: prenatal breast-feeding self-efficacy and narratives from a Black feminist perspective. *J Perinat Neonatal Nurs.* 2011;25(4):320-328.
34. Dennis CL, Faux S. Development and psychometric testing of the Breastfeeding Self-Efficacy Scale. *Res Nurs Health.* 1999;22(5):399-409.
35. Kingston D, Dennis CL, Sword W. Exploring breast-feeding self-efficacy. *J Perinat Neonatal Nurs.* 2007;21(3):207-215.
36. Cleveland AP. Personal efficacy beliefs in breastfeeding. *Int J Childbirth Edu.* 1999;14(3):30-35.
37. O'Brien M, Buikstra E, Hegney D. The influence of psychological factors on breastfeeding duration. *J Adv Nurs.* 2008;63(4):397-408.
38. Haslam C, Lawrence W, Haefeli K. Intention to breastfeed and other important health-related behaviour and beliefs during pregnancy. *Fam Practice.* 2003;20(5):528-530.
39. Bandura A. Guide for constructing self-efficacy scales. In Pajares F, Urdan TC (Ed.) *Self-efficacy beliefs of adolescents* (Vol. 5, pp. 307-337). Charlotte, NC: Information Age Publishing, 2006.
40. Cleveland AP, McCrone S. Development of the Breastfeeding Personal Efficacy Beliefs Inventory: a measure of women's confidence about breastfeeding. *J Nurs Measure.* 2005;13(2):115-127.
41. Dennis CL. The breastfeeding self-efficacy scale: Psychometric assessment of the short form. *J Obstet Gynecol Neonatal Nurs.* 2003;32(6):734-744.

42. Mora A, Russell DW, Dungy CI, Losch M, Dusdieker L. The iowa infant feeding attitude scale: analysis of reliability and validity. *J Appl Soc Psychol.* 1999;29(11):2362-2380.
43. Nommsen-Rivers LA, Dewey KG. Development and validation of the infant feeding intentions scale. *Matern Child Hlth J.* 2009;13(3):334-342.
44. Wells KJ, Thompson NJ, Kloeblen-Tarver AS. Development and psychometric testing of the prenatal breastfeeding self-efficacy scale. *Am J Health Behav.* 2006;30(2):177-187.
45. Chen G, Gully SM, Eden D. Validation of a new general self-efficacy scale. *Org Res Meth.* 2001;4(1):62-83.
46. Wurtele SK. Fetal health locus of control scale: development and validation. *J Consult Clin Psychol.* 1986;54(6):814-819.
47. Francis JJ, Eccles MP, Johnston M, et al. Constructing questionnaires based on the theory of planned behaviour: a manual for health services researchers. Newcastle-upon-Tyne: University of Newcastle, 2004.
48. Armitage CJ, Conner M. Efficacy of the theory of planned behaviour: A meta-analytic review. *Brit J Soc Psychol.* 2001;40(4):471-499.
49. Nunnally JC, Bernstein I. The assessment of reliability. *Psychometric theory.* 1994;3(1):248-292.
50. Arlotti JP, Cottrell BH, Lee SH, Curtin JJ. Breastfeeding among low-income women with and without peer support. *J Com Health Nurs.* 1998;15(3):163-178.
51. Heinig MJ, Follett JR, Ishii KD, Kavanagh-Prochaska K, Cohen R, Panchula J. Barriers to compliance with infant-feeding recommendations among low-income women. *J Hum Lact.* 2006;22(1):27-38.
52. Li R, Fridinger F, Grummer-Strawn L. Public perceptions on breastfeeding constraints. *J Hum Lact.* 2002;18(3):227-235.
53. Schmied V, Beake S, Sheehan A, McCourt C, Dykes F. Women's perceptions and experiences of breastfeeding support: a metasynthesis. *Birth.* 2011;38(1):49-60.
54. Scott JA, Binns CW. Factors associated with the initiation and duration of breastfeeding: a review of the literature. *Breastfeeding Rev.* 1999;7(1):5-16.
55. Renfrew MJ, McCormick FM, Wade A, Quinn B, Dowswell T. Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database Syst Rev.* 2012;5(5):e1-e121.

56. Aidam BA, Pérez-Escamilla R, Lartey A. Lactation counseling increases exclusive breast-feeding rates in Ghana. *J Nutr.* 2005;135(7):1691-1695.
57. Kistin N, Abramson R, Dublin P. Effect of peer counselors on breastfeeding initiation, exclusivity, and duration among low-income urban women. *J Hum Lact.* 1994;10(1):11-15.
58. Shaw E, Kaczorowski J. The effect of a peer counseling program on breastfeeding initiation and longevity in a low-income rural population. *J Hum Lact.* 1999;15(1):19-25.

## CHAPTER 3

### SOCIODEMOGRAPHIC DIFFERENCES IN BREASTFEEDING SELF-EFFICACY AMONG PRENATAL PREGNANT WOMEN USING THE PRENATAL RATING OF EFFICACY IN PREPARATION TO BREASTFEED SCALE

Breastfeeding is nourishing a child by providing breast milk, either directly from the breast or expressed by other means, such as with a breast pump or by hand expression.<sup>1</sup> Breast milk acts as a natural extension of life from the mother after the child exits the womb. There are many benefits to breastfeeding. The Academy of Nutrition and Dietetics<sup>2</sup> and the American Academy of Pediatrics<sup>3</sup> report in position and policy statements the benefits to infants include, but are not limited to, optimal nutrition for the infant, safe and fresh milk, enhanced immune system, and promotion of correct development of jaw and teeth. Breastfed infants may also experience a reduced risk for gastroenteritis, asthma and severe lower respiratory tract infections, allergies and intolerances, infant morbidity and mortality, and obesity and diabetes. Breastfeeding benefits for the mother include creating a strong bond with the infant, increased energy expenditure, increased contracting and shrinking of the uterus to pre-pregnancy size, saving time otherwise spent preparing formula, and saving money instead of buying formula. Breastfeeding mothers may also experience decreased risk for breast and uterine cancer, Type II diabetes, and post-partum depression.<sup>4</sup>

The common recommendation by many organizations is for new mothers to breastfeed exclusively for the first six months of an infant's life with continued breastfeeding with complimentary foods to one year or longer.<sup>2,3,5-8</sup> The 2016 Breastfeeding Report Card<sup>9</sup> reports



rates of breastfeeding initiation, duration and exclusivity for babies born in 2013 in the United States from the National Immunization Survey. In 2013, they found that 81.1%, 44.4%, and 22.3% of infants were ever breastfed, exclusively breastfed for at least the first three months of life, and exclusively breastfed for at least the first six months of life, respectively. The current Healthy People 2020 goals for breastfed babies are 81.9% ever breastfed, 46.2% exclusively breastfed for at least the first three months of life, and 25.5% exclusively breastfed for at least the first six months of life.<sup>10</sup> The current breastfeeding rates of the nation are close to but not meeting the recommended goals set forth by the U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion. The costs incurred from suboptimal breastfeeding rates in the U.S. are severe. In 2014, more than 3 billion dollars per year were spent on total medical costs for mothers and babies and another 1.3 billion dollars spent on non-medical costs due to a high diagnosis rate of medical conditions that could have been reduced or avoided with breastfeeding.<sup>11,12</sup>

### *Breastfeeding Self-efficacy*

Self-efficacy theory<sup>13</sup> states that individuals tend to choose tasks they feel are within the boundaries of their abilities. Competence and ability to perform a given task may enhance the level of confidence one has in performing and managing the task. Mastery experience, vicarious experience, verbal persuasion, and physiological responses affect the level of self-efficacy a person may have towards a new behavior, positively and negatively. Cognitive and affective processes are carried out in an attempt to manage self-efficacy, with locus of control helping to better convey the belief in who or what really has control over the new behavior: fate or personal action. The level of self-efficacy for a behavior affects the decision to actually engage in the behavior.<sup>14,15</sup> With regard to breastfeeding, the choice to engage in the activity may or may not

be related to level of perceived efficacy a woman has to complete the task.<sup>16</sup> A mother deciding to breastfeed must not only understand the benefits of breastfeeding, but must also believe she can be successful at doing so.<sup>16</sup> Preparation in the prenatal period is key to building self-efficacy.

### *Breastfeeding Intention*

A woman who has set a strong intention to breastfeed is more likely to actually initiate breastfeeding after birth.<sup>17-21</sup> Breastfeeding intention also appears to be related to breastfeeding self-efficacy in the prenatal period, with mothers who had the intention to breastfeed having significantly higher self-efficacy scores than mothers who indicated they did not intend to breastfeed.<sup>22,23</sup> Several dimensions of breastfeeding intention include belief in ability to perform the physical act itself, exposure to opportunities to observe breastfeeding by others, psychological preparation and management of feelings about breastfeeding, and social aspects such as exposure to other people's thoughts and feelings about breastfeeding.<sup>24,25</sup>

### *Sociodemographic Factors and Breastfeeding Self-efficacy*

When compared to their counterparts, young, unmarried, AA women with low educational status are less likely to initiate BF.<sup>9,26-28</sup> However, there appears to be no significant difference in postpartum breastfeeding self-efficacy based on marital status,<sup>29-33</sup> age,<sup>29,30,32,34-38</sup> education level,<sup>29,30,32,36,37</sup> or ethnicity.<sup>29,30,32,34,37</sup> Two studies found significant differences in breastfeeding self-efficacy scores based on race and ethnicity among samples that were comprised of a high percentage of black or African-American women.<sup>22,23</sup>

Multiple studies indicate that a pregnancy with a first child may have a negative effect on breastfeeding self-efficacy, but only when measured during the postpartum period.<sup>29,39-44</sup> The infant feeding decision can also be influenced by the expectation of family to return to the

household and resume daily duties without much distraction from the newly born child.<sup>45</sup> Differences between nulliparous and multiparous mothers' prenatal breastfeeding self-efficacy measurements (regardless of breastfeeding experience) are not found in the literature to date. The experience of having breastfed a previous child appears to significantly influence prenatal breastfeeding self-efficacy with higher scores recorded among experienced mothers compared to mothers with no breastfeeding experience.<sup>23</sup> Research suggests that pregnant mothers have greater breastfeeding self-efficacy if they were breastfed themselves by their own mothers.<sup>30</sup> More exposure to breastfeeding mothers has been shown to cultivate a positive attitude and increase knowledge about breastfeeding among pregnant women.<sup>46,47</sup>

The research related to mode of delivery and breastfeeding self-efficacy is conflicting. Two studies found no significant difference in postpartum breastfeeding self-efficacy scores between women who gave birth vaginally and those who had a cesarean delivery.<sup>37,48</sup> However, Wutke and Dennis<sup>33</sup> found a significant difference between the two modes of delivery and postpartum self-efficacy levels in a sample of Polish women, with similar results found among a sample of Canadian women.<sup>29</sup> Literature regarding prenatal breastfeeding self-efficacy and intended mode of delivery is not currently available.

Research shows that women with pre-pregnancy body mass index (BMI) within the range of underweight or obese are less likely to initiate breastfeeding than women who have a BMI within the normal weight or overweight range.<sup>49-51</sup> However, a gap in the literature exists regarding how pre-pregnancy weight status may affect breastfeeding self-efficacy in both the prenatal and postpartum periods.

Breastfeeding self-efficacy decreases when women return to work. In a sample of pregnant African-American women, a major obstacle cited among those with low breastfeeding

self-efficacy was working in a work setting with no breastfeeding policies and being unsure if they could continue breastfeeding after returning to work.<sup>22</sup> Studies examining the effect of a mother's plan to return to work on breastfeeding self-efficacy during the prenatal phase in other populations are not currently available. The purpose of this study was to investigate factors associated with breastfeeding self-efficacy among pregnant women during the prenatal stage.

## **Methods**

### *Participant Recruitment*

Participants were recruited from a convenience sample of 395 patients from the Obstetrics and Gynecology (OB/GYN) clinic at the University Medical Center on the campus of The University of Alabama (UA). Participants of any race, ethnicity, or stage of pregnancy that were 18 years or older were invited to participate in the study. Both women who were under the age of 18 and women who were pregnant with multiples (e.g., twins, triples, etc.) were excluded from the study. Pregnant women who did not speak English were also excluded, because the study questionnaire was only available in English. The institutional review boards at UA and within the College of Community Health Science approved this study to be completed in the spring of 2017.

### *Data Collection*

Data collection took place over seven weeks in March and April, 2017. Participants who were in the clinic lobby awaiting scheduled appointments with a physician were approached to participate in the study. A study information flyer was located at the front desk of the clinic. The principle investigator also used the flyer to discuss the study details with potential participants.

After a short screen to ensure each woman was pregnant and over the age of 18, a brief study description was provided. If the woman was interested in participating, then the principle investigator explained the informed consent and had the participants sign before the survey began. All participants completed a paper survey in the lobby area and were each given a \$5 cash incentive for their participation.

### *Instrument*

The Prenatal Rating of Efficacy in Preparation to Breastfeed (PREP to BF) Scale<sup>52</sup> is a valid ( $\alpha=.980$ ) and reliable ( $r=0.920$ ) 39-item questionnaire that measures prenatal breastfeeding self-efficacy. This score is significantly correlated ( $r=0.610$ ,  $p<.001$ ) with breastfeeding intention. The questionnaire assessed individual processes (14 items;  $\alpha=.974$ ), interpersonal processes (16 items;  $\alpha=.955$ ), professional advice (5 items;  $\alpha=.944$ ), and social support (4 items;  $\alpha=.851$ ). All questions began with the root: “Thinking about your life right now, how well can you...” The 39 items are each rated on a scale of 0 (“cannot do at all”) to 10 (“highly certain can do”), with a total prenatal breastfeeding self-efficacy score of 0 to 390. An average score, with a range of 0 to 10, was calculated for each of the four factors by summing the factor scores and dividing by the number of questions loaded on each factor.

Breastfeeding intention was measured using a valid ( $\alpha=.975$ ) three-item scale that asked the participants to rank their agreement with the questions on a scale from 1 (“strongly disagree”) to 7 (“strongly agree”). The questions asked the participants if they “expect to,” “want to,” and “intend to” breastfeed the baby from their current pregnancy. An average score for breastfeeding intention, with a range from 1 to 7, was calculated for data analysis.

Sociodemographic and personal factor questions assessed: age, race, ethnicity, marital status, education, self-report of height, self-report of pre-pregnancy weight, parity, planned mode of delivery, previous breastfeeding experience, and plan to return to work within one year.

### *Data Analysis*

Data were subjected to Mann-Whitney U and Kruskal Wallance H tests to assess differences in the mean prenatal breastfeeding self-efficacy scores and sociodemographic factors at the significance level of  $P<.05$ . Data were subjected to Mann-Whitney U and Kruskal Wallance H tests to assess differences at the significance level of  $P<.005$  (to account for Bonferroni's correction) in scoring of the four factors of the PREP to BF scale and the sociodemographic factors. The amount of variance in the PREP to BF score explained by the significant sociodemographic factors was assessed using factorial analysis of variance (ANOVA) at the significance level of  $P<.05$ . Statistical analyses were conducted using Statistical Package for the Social Sciences (SPSS) version 24.<sup>53</sup>

## **Results**

### *Demographics*

A total of 145 (36.7%) women were screened from a total of 395 potential participants. Women who were not pregnant or under age 18 at the time of data collection were excluded. The survey was completed on site by 133 (91.7%) of the women who qualified. Nine surveys (6.7%) were excluded from the analyses due to incomplete survey data leaving a total of 124 participants. The mean age of participants was 26.2 years  $\pm$  4.68 years with a range of 18 to 38. As illustrated in Table 4, 44.3% of the participants were non-Hispanic white, 31.4% were married, and 54.8% had completed at least some college education or higher. Two thirds of the

women (66.1%) indicated they had previously given birth to at least one child. Among these multiparous women (n=82), 58.5% indicated they previously breastfed a child. A small percentage (23.4%) of the participants indicated they would not return to work in the first year after the child was born. Approximately sixty four percent (63.7%) indicated they either agreed or strongly agreed with the statements regarding intention to breastfeed after delivery. The participants had a mean prenatal breastfeeding self-efficacy score of 299.5 with a range of 0 to 390.

#### *Prenatal Breastfeeding Self-efficacy*

Data were tested for normality by performing a Shapiro-Wilk test that indicated the data were not normal ( $P < .001$ ). Table 4 depicts the mean prenatal breastfeeding self-efficacy scores by sociodemographic factors. In univariate analyses, women who had at least some college education ( $P = .003$ ), were currently married ( $P = .027$ ), had breastfed previously ( $P = .035$ ), and planned to deliver vaginally ( $P = .043$ ) had significantly greater PREP to BF scores than their counterparts. No significant differences in mean PREP to BF scores were seen between groups by race, age, parity, having been breastfed as a child, pre-pregnancy BMI, and plan to return to work in this sample of pregnant women.

**Table 4.** Sociodemographic Factors and Mean Prenatal Rating of Efficacy in Preparation to Breastfeed Scale Scores among Pregnant Women.

<b>Characteristics</b>	<b>n</b>	<b>%</b>	<b>Mean PREP to BF Scores (SD)<sup>a</sup></b>	<b>P</b>
Race (n=124)				.062
Non-Hispanic white	55	45	8.13 (2.04)	
Non-Hispanic black	69	55	7.31 (2.55)	
Age (n=124)				.677
18 - 25	53	43	7.89 (2.05)	
26 - 38	71	57	7.51 (2.58)	
Education (n=123)				.003*
High school diploma or less	55	45	6.95 (2.76)	
Some college or more	68	55	8.28(1.82)	
Marital Status (n=121)				.027*
Single	82	67	7.31(2.55)	
Married	39	33	8.33 (1.82)	
Parity (n=123)				.156
Nulliparous	41	33	8.11 (2.08)	
Multiparous	82	67	7.44 (2.48)	
Breastfeeding Experience (n=123)				.035*
Yes	48	40	8.22 (1.89)	
No	75	60	7.28 (2.57)	
Breastfed as a Child (n=122)				.161
Yes	36	29	8.18 (2.04)	
No	57	46	7.28 (2.53)	
Unsure	30	25	7.75(2.37)	
Planned Mode of Delivery (n=120)				.043*
Vaginal	97	80	7.84 (2.22)	
Caesarian (C-Section)	23	20	6.71 (2.68)	
Pre-pregnancy BMI (n=118)				.998
Under and Normal (< 18.5 – 25.0)	52	44	7.70 (2.41)	
Overweight (25.1 – 30.0)	30	25	7.67 (2.41)	
Obese classes I-III (30.1 – > 40.1)	36	31	7.84 (2.09)	
Return to work within 1 year (n=123)				.866
Yes	95	77	7.40 (2.90)	
No	28	23	7.75 (2.20)	

<sup>a</sup> Mann-Whitney U and Kruskal Wallace H tests were used to determine differences in mean Prenatal Rating of Efficacy in Preparation to Breastfeed (PREP to BF) Scores.

\*indicates a significant difference between groups



Based on the number of categorical sociodemographic factors, it was determined a multiple regression analysis was not appropriate for this data set. Factorial ANOVA was performed to determine the amount of variance in total PREP to BF score that was explained by the significant sociodemographic factors. Although the self-efficacy score data were not normally distributed, the plotted standardized residuals were normally distributed indicating transformation of the data was not required. The categorical factors of education, marital status, and prior breastfeeding experience were included in the final analysis. Though intended mode of delivery was a significant sociodemographic factor with self-efficacy, it was excluded due to missing cell data compromising the integrity of the analysis. The final analysis with education ( $P=.037$ ), marital status ( $P=.251$ ), and prior breastfeeding experience ( $P=.041$ ) explained 12.7% of the variance in total breastfeeding self-efficacy score. There were no significant interactions between the three demographics.

Further nonparametric univariate testing was completed to examine how the mean scores of the individual questionnaire factors differed by the sociodemographic factors, as displayed in Table 5. Interpersonal processes ( $P=.004$ ) and professional advice ( $P=.002$ ) factor scores were significantly higher for women with at least some college education. When compared to their counterparts, social support scores were higher among non-Hispanic white women ( $P<.001$ ) and women who were married ( $P=.001$ ).

**Table 5.** Sociodemographic Factors and Mean Prenatal Breastfeeding Self-efficacy Factor Scores among Pregnant Women.

<b>Characteristics</b>	<b>Mean Individual Processes Score (SD) <sup>a</sup></b>	<b>P</b>	<b>Mean Interpersonal Processes Score (SD) <sup>a</sup></b>	<b>P</b>	<b>Mean Professional Advice Score (SD) <sup>a</sup></b>	<b>P</b>	<b>Mean Social Support Score (SD) <sup>a</sup></b>	<b>P</b>
Race (n=124)		.268		.164		.083		<.001*
Non-Hispanic white	8.43 (2.39)		7.56 (2.34)		9.02 (2.03)		8.42 (2.01)	
Non-Hispanic black	7.80 (2.77)		6.89 (2.69)		8.21 (2.70)		6.57 (3.01)	
Age (n=124)		.095		.885		.589		.553
18 - 25	8.48 (2.33)		7.29 (2.28)		8.75 (2.20)		7.47 (2.30)	
26 - 38	7.78 (2.79)		7.11 (2.75)		8.43 (2.63)		7.33 (3.08)	
Education (n=123)		.010		.004*		.002*		.017
High school diploma or less	7.37 (3.08)		6.41 (2.92)		7.89 (3.03)		6.76 (3.02)	
Some college or more	8.67 (2.03)		7.82 (2.05)		9.14 (1.71)		7.93 (2.44)	
Marital Status (n=121)		.135		.109		.017		.001*
Single	7.77 (2.85)		6.85 (2.73)		8.22 (2.70)		6.79 (2.98)	
Married	8.66 (2.11)		7.73 (2.07)		9.23 (1.76)		8.63 (1.83)	
Parity (n=123)		.154		.349		.065		.319
Nulliparous	8.56 (2.36)		7.51 (2.32)		9.03 (2.21)		8.01 (2.02)	
Multiparous	7.82 (2.73)		7.00 (2.66)		8.32 (2.56)		7.06 (3.04)	
Breastfeeding Experience (n=123)		.033		.073		.120		.138
Yes	8.70 (2.13)		7.74 (2.11)		9.13 (1.71)		7.72 (2.75)	
No	7.66 (2.83)		6.80 (2.75)		8.19 (2.79)		7.17 (2.78)	
Breastfed as a Child (n=122)		.064		.192		.369		.626
Yes	8.71 (2.19)		7.68 (2.27)		9.05 (1.93)		7.60 (2.61)	
No	7.65 (2.78)		6.76 (2.74)		8.22 (2.75)		7.18 (2.80)	
Unsure	8.08 (2.72)		7.33 (2.46)		8.60 (2.41)		7.50 (2.95)	
Planned Mode of Delivery (n=120)		.140		.059		.039		.016
Vaginal	8.18 (2.58)		7.37 (2.39)		8.71 (2.39)		7.69 (2.61)	
Caesarian (C-Section)	7.43 (2.87)		6.04 (3.03)		7.79 (2.79)		5.95 (3.19)	

<b>Characteristics</b>	<b>Mean Individual Processes Score (SD) <sup>a</sup></b>	<b><i>P</i></b>	<b>Mean Interpersonal Processes Score (SD) <sup>a</sup></b>	<b><i>P</i></b>	<b>Mean Professional Advice Score (SD) <sup>a</sup></b>	<b><i>P</i></b>	<b>Mean Social Support Score (SD) <sup>a</sup></b>	<b><i>P</i></b>
Pre-pregnancy BMI (n=118)		.840		.947		.803		.887
Under and Normal (< 18.5 – 25.0)	7.97 (2.74)		7.24 (2.68)		8.63 (2.53)		7.65 (2.51)	
Overweight (25.1 – 30.0)	8.09 (2.63)		7.16 (2.55)		8.55 (2.41)		7.38 (2.80)	
Obese classes I-III (30.1 – > 40.1)	8.42 (2.23)		7.31 (2.32)		8.75 (2.11)		7.20 (2.91)	
Return to work w/i 1 year (n=123)		.231		.816		.851		.738
Yes	8.23 (2.44)		7.22 (2.48)		8.67 (2.28)		7.39 (2.69)	
No	7.58 (3.17)		7.04 (2.86)		7.04 (2.86)		7.36 (3.07)	

<sup>a</sup> Mann-Whitney U and Kruskal Wallace H tests were used to determine differences in mean Prenatal Rating of Efficacy in Preparation to Breastfeed (PREP to BF) Scale factor scores.

Note: Bonferroni correction was used for multiple comparisons ( $P < .005$ ).

\*indicates a significant difference between groups.

## Discussion

The purpose of this study was to study factors associated with breastfeeding self-efficacy among pregnant women during the prenatal stage. A validated questionnaire was utilized that measures a pregnant woman's confidence in the ability to perform preparatory activities for breastfeeding (e.g. observing and modeling breastfeeding, talking about breastfeeding, and goal setting) and not postpartum breastfeeding activities. This study revealed significantly higher PREP to BF scores among women who completed at least some college, were married, had previous breastfeeding experience, and those who planned on having a vaginal birth. Previous studies measuring prenatal breastfeeding self-efficacy found similar results regarding prior experience,<sup>23</sup> but no significant differences with regard to education or marital status.<sup>22,23</sup>

Results in the literature analyzing planned modes of delivery and prenatal breastfeeding self-efficacy are not currently available. There were no significant differences scores by race, age, parity, breastfed as a child, pre-pregnancy BMI, and plan to return to work. Previous studies found significant differences in prenatal self-efficacy when analyzed by race, but the two studies analyzed the same sample with a high percentage (74.2%) of black women. The same two studies also found that age did not have a significant effect on prenatal breastfeeding self-efficacy score.<sup>22,23</sup> The differences in the results of this study, compared to previous studies of breastfeeding self-efficacy during the prenatal phase, may be the product of the newly designed questions focusing more on confidence in preparatory activities for breastfeeding and not confidence with postpartum breastfeeding scenarios.

The factorial ANOVA revealed the significant sociodemographic factors of education, marital status, and previous breastfeeding experience explained almost 13% of the variance in PREP to BF scores in this sample. PREP to BF score and breastfeeding intention are also highly

and significantly correlated in this sample of pregnant women.<sup>52</sup> This is consistent with previous studies measuring prenatal breastfeeding self-efficacy and intention among pregnant women with a valid questionnaire.<sup>22,23</sup> The percentage of variance explained is low, but encouraging, seeing as though being married, having at least some college education, and having breastfeeding experience had a positive effect on breastfeeding initiation in previous studies.<sup>23,26,28</sup> The small sample size may have limited the inclusion of significant factors into the analysis. Future research should include larger groups and more continuous demographic survey items to support more thorough univariate analyses and a wider array of multivariate analysis options.

The analysis of the four questionnaire factor scores helps to better understanding which facets of breastfeeding self-efficacy among pregnant women in the prenatal phase differ by sociodemographic factors. A prenatal breastfeeding self-efficacy intervention could be better tailored to a population using this type of analysis. Non-Hispanic black and single pregnant women who had significantly lower social support scores may benefit most from intervention efforts to improve communication and group decision making about breastfeeding with friends and family. Based on differences in interpersonal processes scores, women with less than a high school education may benefit from working with a lactation counselor or peer breastfeeding educator to increase confidence in modeling breastfeeding behaviors and discussing breastfeeding with other people. Previous research suggests intervention groups pairing a lactation counselor or peer educator with women during pregnancy showed higher breastfeeding self-efficacy and breastfeeding initiation rates (when measured in the postpartum period) than groups with no lactation counselor or peer educator contact during pregnancy.<sup>54-56</sup> Lactation counselors and peer educators may also assist women who have low confidence in being able to

depend on the support friends and family provide. The differences in professional advice scores indicate health care professionals may need to encourage and build breastfeeding confidence among women with less than a high school education.

The current study has limitations of sampling among non-Hispanic white and black women from one OB/GYN clinic in the southern United States. The results from this study cannot be generalized to other groups of pregnant women in other healthcare settings. Data collection took place over two months in the spring of 2017. Only the women who were actively pregnant during that time span and who arrived for clinic appointments while the researcher was on-site were eligible to participate in the study. All members of the target population did not have an equal chance of being recruited for this study. Participants who had no intention to breastfeed may have interpreted and answered the survey questions differently than those who had a strong intention to breastfeed.

At times some participants had a friend or family member present who was observing the participant fill out the survey in the waiting area, which may have influenced how the women were answering the questions. Sociodemographic factors of pre-pregnancy weight and height were measured by self-report and may not reflect an accurate picture of each participant's prenatal weight status. Future studies should be conducted with pregnant women in more private settings of healthcare clinics with a researcher available during all clinic hours over a longer period of total study time. Approval to access patient chart data for measures such as pre-pregnancy height and weight should be obtained.

## **Implications for Research and Practice**

Women tend to make decisions about infant feeding methods while they are pregnant.<sup>57,58</sup> Positive feelings of confidence that may arise from preparing for breastfeeding may contribute to a woman having a higher level of breastfeeding self-efficacy.<sup>59</sup> This study, although preliminary, adds to the current literature regarding prenatal breastfeeding self-efficacy of pregnant women. The PREP to BF scale provides a valid measure of prenatal breastfeeding self-efficacy to assist healthcare professionals with confidence enhancing support efforts. The scale may be used to assist in the identification of women at risk for not breastfeeding. Identifying pregnant women with low breastfeeding self-efficacy is vital in order for health care professionals to address ways to increase social support, communication, goal setting skills, and overcoming mental and emotional barriers. This will help those who want to breastfeed actually initiate after birth.

The scale may also help to identify women with higher confidence scores. Having high self-efficacy should be recognized by health professionals to help ensure those women maintain a confident mindset. Lastly, the PREP to BF scale and its subscales may be used to develop and evaluate prenatal breastfeeding support programs. Future research should further investigate the effects of the sociodemographic factors on breastfeeding self-efficacy among larger, more diverse samples of pregnant women in various healthcare settings to strengthen the understanding of these relationships. A strong understanding of which pregnant women may or may not be at risk for non-initiation of breastfeeding may help healthcare professionals create and provide the most appropriate support to their patients.

## References

1. World Health Organization. Indicators for assessing infant and young child feeding practices: part 1: definitions: conclusions of a consensus meeting held 6-8 November 2007 in Washington DC, USA; 2008.
2. Lessen R, Kavanagh K. Position of the academy of nutrition and dietetics: promoting and supporting breastfeeding. *J Acad Nutr Diet*. 2015;115(3):444-449.
3. Eidelman AI, Schanler RJ, Johnston M, et al. Breastfeeding and the use of human milk. *Pediatrics*. 2012;129(3):e827-e841.
4. Newton NR, Newton M. Relationship of ability to breast feed and maternal attitudes toward breast feeding. *Pediatrics*. 1950;5(5):869-875.
5. United States Breastfeeding Committee. Statement of Exclusive Breastfeeding. 2015; <http://www.usbreastfeeding.org/p/cm/ld/fid=22>. Accessed May 9, 2017.
6. Chantry CJ, Eglash A, Labbok M. ABM Position on Breastfeeding—Revised 2015. *Breastfeeding Med*. 2015;10(9):407-411.
7. American Association of Physicians (AAFP). *Breastfeeding, family physicians supporting (position paper)*. Leawood, KS: AAFP; 2008.
8. Committee on Health Care for Underserved Women. ACOG Committee Opinion No. 361: Breastfeeding: maternal and infant aspects. *Obstet Gynecol*. 2007;109(2):479-479.
9. Centers for Disease Control and Prevention. Breastfeeding Report Card 2016. 2016. <https://www.cdc.gov/breastfeeding/pdf/2016breastfeedingreportcard.pdf>. Accessed May 9, 2017.
10. Healthy People 2020. 2015; <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=26>. Accessed May 9, 2017.
11. Bartick M. Breastfeeding and the U.S. economy. *Breastfeeding Med*. 2011;6(5):313-318.
12. Bartick MC, Stuebe AM, Schwarz EB, Luongo C, Reinhold AG, Foster EM. Cost analysis of maternal disease associated with suboptimal breastfeeding. *Obstet Gynecol*. 2013;122(1):111-119.
13. Bandura A. Self-efficacy. In, VS Ramachaudran, ed. *Encyclopedia of Human Behavior*. New York, NY: Academic Press: 1994:71-81.
14. Bandura A, McClelland DC. *Social Learning Theory*. New York City, NY: General Learning Press; 1977.



15. Hayden J. *Introduction to Health Behavior Theory*. Burlington, MA: Jones & Bartlett Learning; 2009.
16. Dennis CL, Faux S. Development and psychometric testing of the breastfeeding self-efficacy scale. *Res Nurs Health*. 1999;22(5):399-409.
17. Caulfield LE, Gross SM, Bentley ME, et al. WIC-based interventions to promote breastfeeding among African-American women in Baltimore: effects on breastfeeding initiation and continuation. *J Hum Lact*. 1998;14(1):15-22.
18. Kessler LA, Gielen AC, Diener-West M, Paige DM. The effect of a woman's significant other on her breastfeeding decision. *J Hum Lact*. 1995;11(2):103-109.
19. Losch M, Dungy CI, Russell D, Dusdieker LB. Impact of attitudes on maternal decisions regarding infant feeding. *J Pediatr*. 1995;126(4):507-514.
20. Manstead ASR, Proffitt C, Smart JL. Predicting and understanding mothers' infant-feeding intentions and behavior: testing the theory of reasoned action. *J Pers Soc Psychol*. 1983;44(4):657-671.
21. Quarles A, Williams PD, Hoyle DA, Brimeyer M, Williams AR. Mothers' intention, age, education and the duration and management of breastfeeding. *Matern Child Nurs J*. 1994;22(3):102-108.
22. Robinson KM, VandeVusse L. African American women's infant feeding choices: prenatal breast-feeding self-efficacy and narratives from a Black feminist perspective. *J Perinat Neonatal Nurs*. 2011;25(4):320-328.
23. Wells KJ, Thompson NJ, Kloeblen-Tarver AS. Development and psychometric testing of the prenatal breastfeeding self-efficacy scale. *Am J Health Behav*. 2006;30(2):177-187.
24. Hoddinott P, Kroll T, Raja A, Lee AJ. Seeing other women breastfeed: how vicarious experience relates to breastfeeding intention and behaviour. *Matern Child Nutr*. 2010;6(2):134-146.
25. Kloeblen-Tarver AS, Thompson NJ, Miner KR. Intent to breast-feed: The impact of attitudes, norms, parity, and experience. *Am J Health Behav*. 2002;26(3):182-187.
26. Jones KM, Power ML, Queenan JT, Schulkin J. Racial and ethnic disparities in breastfeeding. *Breastfeeding Med*. 2015;10(4):186-196.
27. Moore ER, Coty MB. Prenatal and postpartum focus groups with primiparas: breastfeeding attitudes, support, barriers, self-efficacy, and intention. *J Pediatr Health Car*. 2006;20(1):35-46.

28. Sutherland T, Pierce C, Blomquist J, Handa V. Breastfeeding practices among first-time mothers and across multiple pregnancies. *Matern Child Hlth J.* 2012;16(8):1665-1671.
29. Dennis CL. The breastfeeding self-efficacy scale: Psychometric assessment of the short form. *J Obstet Gynecol Neonatal Nurs.* 2003;32(6):734-744.
30. Dennis CL, Heaman M, Mossman M. Psychometric testing of the breastfeeding self-efficacy scale-short form among adolescents. *J Adolesc Health.* 2011;49(3):265-271.
31. McCarter-Spaulding DE, Dennis C. Psychometric testing of the breastfeeding self-efficacy scale-short form in a sample of Black women in the United States. *Res Nurs Health.* 2010;33(2):111-119.
32. Nommsen-Rivers LA, Dewey KG. Development and validation of the infant feeding intentions scale. *Matern Child Hlth J.* 2009;13(3):334-342.
33. Wutke K, Dennis C-L. The reliability and validity of the Polish version of the breastfeeding self-efficacy scale-short form: translation and psychometric assessment. *Int J Nurs Stud.* 2007;44(8):1439-1446.
34. Danawi H, Estrada L, Hasbini T, Wilson DR. Health inequalities and breastfeeding in the United States of America. *Int J Childbirth Edu.* 2016;31(1):35-39.
35. Blyth R, Creedy DK, Dennis C, Moyle W, Pratt J, De Vries SM. Effect of maternal confidence on breastfeeding duration: an application of breastfeeding self-efficacy theory. *Birth.* 2002;29(4):278-274.
36. Gregory A, Morrison C, Penrose K, Dennis C, MacArthur C. Psychometric assessment of the breastfeeding self-efficacy scale among British women. *Public Health Nurs.* 2008;25(1):278-284.
37. Wheeler BJ, Dennis CL. Psychometric testing of the modified breastfeeding self-efficacy scale (short form) among mothers of ill or preterm infants. *J Obstet Gynecol Neonatal Nurs.* 2013;42(1):70-80.
38. Zubaran C, Foresti K, Schumacher M, et al. The Portuguese version of the breastfeeding self-efficacy scale—short form. *J Hum Lact.* 2010;26(3):297-303.
39. Black RF, Blair J, Jones V, DuRant R. Infant feeding decisions among pregnant women from a WIC population in Georgia. *J Amer Diet Assoc.* 1990;90(2):255-259.
40. Creedy DK, Dennis CL, Blyth R, Moyle W, Pratt J, De Vries SM. Psychometric characteristics of the breastfeeding self-efficacy scale: data from an Australian sample. *Res Nurs Health.* 2003;26(2):143-152.

41. Dai X, Dennis CL. Translation and validation of the breastfeeding self-efficacy scale into Chinese. *J Midwifery Women Health*. 2003;48(5):350-356.
42. Dennis CLE. Identifying predictors of breastfeeding self-efficacy in the immediate postpartum period. *Res Nurs Health*. 2006;29(4):256-268.
43. Henshaw EJ, Fried R, Siskind E, Newhouse L, Cooper M. Breastfeeding self-efficacy, mood, and breastfeeding outcomes among primiparous women. *J Hum Lact*. 2015; 31(3), 511-518.
44. Torres MM, Torres RRD, Rodríguez AMP, Dennis CL. Translation and validation of the breastfeeding self-efficacy scale into Spanish: data from a Puerto Rican population. *J Hum Lact*. 2003;19(1):35-42.
45. Ogbuanu CA, Probst J, Laditka SB, Liu J, Baek J, Glover S. Reasons why women do not initiate breastfeeding: a southeastern state study. *Women's Health Iss*. 2009;19(4):268-278.
46. Cusson RM. Attitudes toward breast-feeding among female high-school students. *Pediatr Nurs*. 1985;11(3):189-191.
47. Friel JK, Hudson NI, Banoub S, Ross A. The effect of a promotion campaign on attitudes of adolescent females towards breastfeeding. *Can J Pub Health*. 1988;80(3):195-199.
48. Aluş Tokat M, Okumuş H, Dennis C-L. Translation and psychometric assessment of the breast-feeding self-efficacy scale—short form among pregnant and postnatal women in Turkey. *Midwifery*. 2010;26(1):101-108.
49. Li R, Jewell S, Grummer-Strawn L. Maternal obesity and breast-feeding practices. *The Am J Clin Nutr*. 2003;77(4):931-936.
50. Masho SW, Cha S, Morris MR. Prepregnancy obesity and breastfeeding noninitiation in the United States: an examination of racial and ethnic differences. *Breastfeeding Med*. 2015;10(5):253-262.
51. Thompson LA, Zhang S, Black E, et al. The association of maternal pre-pregnancy body mass index with breastfeeding initiation. *Matern Child Hlth J*. 2013;17(10):1842-1851.
52. McKinley EM KL, Turner LW, Burnham JJ, Graettinger KR, Hernandez-Reif M, and Leeper JD Development and psychometric testing of the prenatal rating of efficacy in preparation to breastfeed scale: a new measurement instrument for prenatal breastfeeding self-efficacy. The University of Alabama; 2017:12-37.
53. *IBM SPSS Statistics for Windows, Version 24.0*. [computer program]. Armonk, NY: IBM Corporation; Released 2015.

54. Ansari S, Abedi P, Hasanpoor S, Bani S. The effect of interventional program on breastfeeding self-efficacy and duration of exclusive breastfeeding in pregnant women in Ahvaz, Iran. *Int Scholarly Res Notice*. 2014;1-7.
55. Ingram J. A mixed methods evaluation of peer support in Bristol, UK: mothers', midwives' and peer supporters' views and the effects on breastfeeding. *BMC Preg Childbirth*. 2013;13(1):192.
56. Srinivas GL, Benson M, Worley S, Schulte E. A clinic-based breastfeeding peer counselor intervention in an urban, low-income population interaction with breastfeeding attitude. *J Hum Lact*. 2015;31(1):120-128.
57. Buxton KE, Gielen AC, Faden RR, Brown CH, Paige DM, Chwalow AJ. Women intending to breastfeed: predictors of early infant feeding experiences. *Am J Prev Med*. 1991;7(2):101-106.
58. Dix DN. Why women decide not to breastfeed. *Birth*. 1991;18(4):222-225.
59. Dennis CL. Theoretical underpinings of breastfeeding confidence: A self-efficacy framework. *J Hum Lact*. 1999;15(3):195-202.

## CHAPTER 4

### OVERALL CONCLUSIONS

The purposes of this study were to: (a) create, test, and validate a new scale to measure prenatal breastfeeding self-efficacy, (b) test the reliability of the scale, (c) determine the correlation between prenatal breastfeeding self-efficacy and breastfeeding intention, and (d) assess the differences in prenatal breastfeeding self-efficacy by the sociodemographic factors. Measuring the level of breastfeeding self-efficacy during pregnancy could alert prenatal women and health professionals to particular individual skill sets needed to successfully initiate breastfeeding after birth. Overall conclusions are discussed below, as well as implications for health practitioners.

#### **Creation of the Prenatal Rating of Efficacy in Preparation to Breastfeed Scale**

The Prenatal Rating of Efficacy in Preparation to Breastfeed (PREP to BF) Scale is a valid ( $\alpha=.980$ ) and reliable ( $r=.920$ ) measure of breastfeeding self-efficacy among pregnant women in the prenatal period. Confirmatory factor analysis did not confirm the initial model but did confirm a model that revealed four key areas of preparation that influence breastfeeding self-efficacy in the prenatal period. The internal consistency of the questionnaire, at both test ( $\alpha=.980$ ) and retest ( $\alpha=.973$ ) periods, was well above the desired criterion of .80 alpha for new instruments.<sup>160</sup> After an exploratory factor analysis, the resulting four factors in the final model were highly and significantly correlated to one another. The four key areas, or factors, of individual processes, interpersonal processes, professional advice, and social support are not all

reflected as factors in previously validated scales to measure breastfeeding self-efficacy. While other breastfeeding self-efficacy scales<sup>42,43,46,120</sup> place an emphasis on breastfeeding knowledge, technique, and problem solving, this scale focuses more on the internal and interpersonal factors, and available support systems needed to make the decision to breastfeed prior to delivery. Questions from the individual processes factor of this scale assess a woman's confidence in her ability to overcome emotions associated with breastfeeding such as fear, stress, and anxiety, her confidence with overcoming possible barriers, and setting goals for success. The previously validated prenatal breastfeeding self-efficacy scale<sup>46</sup> has a factor that assessed demands of breastfeeding and overcoming barriers, but the barriers were all related to events that would happen in the postpartum period, such as using a breast pump and breastfeeding while upset.

The PREP to BF scale has an interpersonal processes factor that assesses multiple elements of information seeking, verbal discussion about breastfeeding, and accepting advice about breastfeeding from friends, family, or strangers. The scale also assesses a woman's confidence in her ability to seek out and understand breastfeeding information, discuss breastfeeding with a health professional and accept the advice provided from those discussions in a specific professional advice factor. The previous prenatal self-efficacy scale<sup>46</sup> had similar questions related to talking to a health professional or calling a lactation counselor, but did not assess the understanding or accepting of the advice. Social support items are assessed on this survey, as well as the other prenatal self-efficacy scale. The items on the scale assess social support from the point of view of measuring confidence in ability to obtain support and handling friends and family that do not support breastfeeding. The previous prenatal scale only assessed

confidence in a woman's ability to choose to breastfeed despite a lack of support from the partner and family.<sup>46</sup> The scale items acknowledge possible negativity from friends and family, but also assess confidence in being able to depend on the positive support she may receive.

### **Breastfeeding Self-efficacy During Pregnancy is Correlated to Breastfeeding Intention**

The PREP to BF total score is related to breastfeeding intention in this sample of pregnant women. Results from this study suggest that the breastfeeding self-efficacy a pregnant woman has is highly correlated to her level of breastfeeding intention. Those women with higher breastfeeding self-efficacy also had higher breastfeeding intention, and vice-versa. This finding is consistent with previous prenatal breastfeeding self-efficacy studies finding those women who had the intention to breastfeed having significantly higher self-efficacy scores than women who indicated they did not intend to breastfeed.<sup>46,120</sup>

### **Sociodemographic Factors and Prenatal Breastfeeding Self-efficacy**

This study revealed there were significantly higher PREP to BF scores among women who completed at least some college, were married, had previous breastfeeding experience, and those who planned on having a vaginal birth. Previous studies measuring prenatal breastfeeding self-efficacy found similar results with regard to prior experience,<sup>46</sup> but no significant differences with regard to education or marital status.<sup>46,120</sup> Results in the literature analyzing planned modes of delivery and prenatal breastfeeding self-efficacy are not currently available. There were no significant differences in PREP to BF score by race, age, parity, breastfed as a child, pre-pregnancy BMI, and plan to return to work. Previous studies found significant differences in prenatal self-efficacy when analyzed by race, but the two studies analyzed the same sample with

a high percentage (74.2%) of black women. The same two studies also found that age did not have a significant effect on prenatal breastfeeding self-efficacy score.<sup>46,120</sup> The differences in the results of this study, compared to previous studies of prenatal breastfeeding self-efficacy, may be the product of the newly designed questions focusing more on confidence in preparatory activities for breastfeeding and not confidence with postpartum breastfeeding scenarios. The factorial analysis of variance revealed the significant sociodemographic factors of education, marital status, and previous breastfeeding experience explained almost 13% of the variance in PREP to BF scores in this sample. The percentage of variance explained is low, but encouraging, seeing as though being married, having at least some college education, and having breastfeeding experience have all had a positive effect on breastfeeding initiation in previous studies.<sup>24,25,46</sup>

### **Implications for Health Practitioners**

The PREP to BF scale provides a valid measure of breastfeeding self-efficacy during pregnancy to assist healthcare professionals with confidence enhancing support efforts. The instrument may be used by both clinicians and researchers to measure a prenatal pregnant woman's self-efficacy, as well as, reveal areas the mother may need to address such as goal setting skills or overcoming barriers before she gives birth to ensure she commits to her decision to initiate breastfeeding. The scale may also help to identify women with higher confidence scores. Having high self-efficacy should be recognized by health professionals to help ensure those women maintain a confident mindset. A strong understanding of which pregnant women may or may not be at risk for non-initiation of breastfeeding may help healthcare professionals



create and provide the most appropriate support to their patients. Educational programs are needed aimed at increasing pregnant mothers' confidence through goal setting, overcoming barriers, increasing comfort with breastfeeding, and developing communication skills to properly discuss breastfeeding with health professionals, family, and friends. Lastly, the PREP to BF scale and its subscales may be used to evaluate prenatal breastfeeding support programs.

## REFERENCES

1. World Health Organization. Indicators for assessing infant and young child feeding practices: part 1: definitions: conclusions of a consensus meeting held 6-8 November 2007 in Washington DC, USA. 2008.
2. Cadwell K, Turner-Maffeï C. *Pocket Guide for Lactation Management*. Burlington, MA: Jones & Bartlett Publishers; 2013.
3. World Health Organization and the United Nations Children's Fund (UNICEF). *Global strategy for infant and young child feeding*. World Health Organization; 2003.
4. United States Breastfeeding Committee. Statement of Exclusive Breastfeeding. 2015; <http://www.usbreastfeeding.org/p/cm/ld/fid=22>. Accessed March 2, 2016.
5. Chantry CJ, Eglash A, Lobbok M. ABM Position on Breastfeeding—Revised 2015. *Breastfeeding Med*. 2015;10(9):407-411.
6. Committee on Health Care for Underserved Women. ACOG Committee Opinion No. 361: Breastfeeding: maternal and infant aspects. *Obstet Gynecol*. 2007;109(2):479-479.
7. Eidelman AI, Schanler RJ, Johnston M, et al. Breastfeeding and the use of human milk. *Pediatrics*. 2012;129(3):e827-e841.
8. Lessen R, Kavanagh K. Position of the academy of nutrition and dietetics: promoting and supporting breastfeeding. *J Acad Nutr Diet*. 2015;115(3):444-449.
9. American Association of Physicians (AAFP). Breastfeeding, family physicians supporting (position paper). Leawood, KS: AAFP. 2008.
10. Lawrence RM, Lawrence RA. Breastfeeding: more than just good nutrition. *Pediatr Rev/AAP*. 2011;32(7):267-280.
11. Healthy People 2020. 2015; <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=26>. Accessed March 2, 2016.
12. Gibson ME. Getting Back to Basics: The curious history of breastfeeding in the United States. *Am J Nurs*. 2005;105(10):72B-72C.

13. Heinig MJ, Follett JR, Ishii KD, Kavanagh-Prochaska K, Cohen R, Panchula J. Barriers to compliance with infant-feeding recommendations among low-income women. *J Hum Lact.* 2006;22(1):27-38.
14. Li R, Fein SB, Chen J, Grummer-Strawn LM. Why mothers stop breastfeeding: mothers' self-reported reasons for stopping during the first year. *Pediatrics.* 2008;122(2):S69-76.
15. Nommsen-Rivers LA, Chantry CJ, Cohen RJ, Dewey KG. Comfort with the idea of formula feeding helps explain ethnic disparity in breastfeeding intentions among expectant first-time mothers. *Breastfeeding Med.* 2010;5(1):25-33.
16. Dennis CL. Breastfeeding initiation and duration: a 1990-2000 literature review. *J Obstet Gynecol Neonatal Nurs.* 2002;31(1):12-32.
17. Libbus K, Bush TA, Hockman NM. Breastfeeding beliefs of low-income primigravidae. *Int J Nurs Stud.* 1997;34(2):144-150.
18. Raisler J. Against the odds: breastfeeding experiences of low income mothers. *J Midwifery Wom Heal.* 2000;45(3):253-263.
19. Thompson LA, Zhang S, Black E, et al. The association of maternal pre-pregnancy body mass index with breastfeeding initiation. *Matern Child Hlth J.* 2013;17(10):1842-1851.
20. Fein SB, Roe B. The effect of work status on initiation and duration of breast-feeding. *Am J Public Health.* 1998;88(7):1042-1046.
21. Johnston ML, Esposito N. Barriers and facilitators for breastfeeding among working women in the United States. *J Obstet Gynecol Neonatal Nurs.* 2007;36(1):9-12.
22. Guttman N, Zimmerman DR. Low-income mothers' views on breastfeeding. *Soc Sci & Med.* 2000;50(10):1457-1473.
23. Mitra AK, Khoury AJ, Hinton AW, Carothers C. Predictors of breastfeeding intention among low-income women. *Matern Child Hlth J.* 2004;8(2):65-70.
24. Jones KM, Power ML, Queenan JT, Schulkin J. Racial and ethnic disparities in breastfeeding. *Breastfeeding Med.* 2015;10(4):186-196.
25. Sutherland T, Pierce C, Blomquist J, Handa V. Breastfeeding practices among first-time mothers and across multiple pregnancies. *Matern Child Hlth J.* 2012;16(8):1665-1671.
26. Lee HJ, Rubio MR, Elo IT, McCollum KF, Chung EK, Culhane JF. Factors associated with intention to breastfeed among low-income, inner-city pregnant women. *Matern Child Hlth J.* 2005;9(3):253-261.
27. Brown JE. *Nutrition Through the Life Cycle.* Belmont, CA: Cengage Learning; 2011.

28. Bandura A. Self-efficacy. In, VS Ramachaudran, ed. *Encyclopedia of Human Behavior*. New York, NY: Academic Press: 1994:71-81.
29. Bandura A. Health promotion by social cognitive means. *Health Educ Behav*. 2004;31(2):143-164.
30. Bandura A. *Self-efficacy: The Exercise of Control*. New York, NY: Freeman; 1997.
31. Bandura A. Human agency in social cognitive theory. *Amer Psychol*. 1989;44(9):1175.
32. Zulkosky K. Self-efficacy: a concept analysis. Paper presented at: Nursing Forum 2009.
33. Dennis CL. Theoretical underpinnings of breastfeeding confidence: A self-efficacy framework. *J Hum Lact*. 1999;15(3):195-202.
34. Entwistle F, Kendall S, Mead M. Breastfeeding support—the importance of self-efficacy for low-income women. *Matern Child Nutr*. 2010;6(3):228-242.
35. Locklin MP. Telling the world: low income women and their breastfeeding experiences. *J Hum Lact*. 1995;11(4):285-291.
36. Locklin MP, Naber SJ. Does breastfeeding empower women? Insights from a select group of educated, low-income, minority women. *Birth*. 1993;20(1):30-35.
37. Loughlin HH, Clapp-Channing NE, Gehlbach SH, Pollard JC, McCutchen TM. Early termination of breast-feeding: identifying those at risk. *Pediatrics*. 1985;75(3):508-513.
38. Buxton KE, Gielen AC, Faden RR, Brown CH, Paige DM, Chwalow AJ. Women intending to breastfeed: predictors of early infant feeding experiences. *Am J Prev Med*. 1991;7(2):101-106.
39. Hill PD, Humenick SS. Development of the H & H lactation scale. *Nurs Res*. 1996;45(3):136-140.
40. O'Campo P, Faden RR, Gielen AC, Wang MC. Prenatal factors associated with breastfeeding duration: recommendations for prenatal interventions. *Birth*. 1992;19(4):195-201.
41. Segura-Millán S, Dewey K, Perez-Escamilla R. Factors associated with perceived insufficient milk in a low-income urban population in Mexico. *J Nutr*. 1994;124(2):202-212.
42. Dennis CL. The breastfeeding self-efficacy scale: Psychometric assessment of the short form. *J Obstet Gynecol Neonatal Nurs*. 2003;32(6):734-744.

43. Dennis CL, Faux S. Development and psychometric testing of the breastfeeding self-efficacy scale. *Res Nurs Health*. 1999;22(5):399-409.
44. Mora AD, Russell DW, Dungy CI, Losch M, Dusdieker L. The Iowa infant feeding attitude scale: analysis of reliability and validity. *J Appl Soc Psychol*. 1999;29(11):2362-2380.
45. Cleveland AP, McCrone S. Development of the breastfeeding personal efficacy beliefs inventory: a measure of women's confidence about breastfeeding. *J Nurs Measure*. 2005;13(2):115-127.
46. Wells KJ, Thompson NJ, Kloeblen-Tarver AS. Development and psychometric testing of the prenatal breastfeeding self-efficacy scale. *Am J Health Behav*. 2006;30(2):177-187.
47. Bandura A. *Self-efficacy in changing societies*. Cambridge, UK: Cambridge University Press; 1995.
48. World Health Organization. International code of marketing of breast-milk substitutes; 1981.
49. Glanz K, Rimer BK, Viswanath K. *Health Behavior and Health Education: Theory, Research, and Practice*. Hoboken, NJ: John Wiley & Sons; 2008.
50. DiClemente RJ, Crosby RA, Kegler M. *Emerging Theories in Health Promotion Practice and Research*. Hoboken, NJ: John Wiley & Sons; 2009.
51. Mahan LK, Escott-Stump S, Krause MV. *Krause's Food & Nutrition Therapy*. Amsterdam, NLD: Elsevier Saunders; 2008.
52. Bandura A, McClelland DC. *Social Learning Theory*. New York City, NY: General Learning Press; 1977.
53. Hayden J. *Introduction to Health Behavior Theory*. Burlington, MA: Jones & Bartlett Learning; 2009.
54. Ajzen IF, M. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice-Hall; 1980.
55. Ajzen I. The theory of planned behavior. *Organ Behav Hum Dec*. 1991;50(2):179-211.
56. Akri J. Infant feeding: the psychological basis. *Bull World Health Organ*. 1989;67(1):8-9.
57. Thulier D. Breastfeeding in America: a history of influencing factors. *J Hum Lact*. 2009;25(1):85-94.

58. Bean CA. *Methods of Childbirth: a Complete Guide to Childbirth Classes and Maternity Care*. Beijing, CH: Dolphin Books; 1972.
59. Parfitt D. Influencing factors in American women's culture and the history of breastfeeding. *Int Journ Childbirth Edu*. 1994;9(2):31-33.
60. Snitow A. Feminism and motherhood: an American reading. *Feminist Rev*. 1992(40):32-51.
61. Hirschman C, Hendershot GE. Trends in breast feeding among American mothers. *Vital and Health Statistics. Series 23: Data From the National Survey of Family Growth*. 1979(3):1-39.
62. McCarthy PJ. Replication: an approach to the analysis of data from complex surveys. *Vital and Health Statistics. Series 2, Data Evaluation and Methods Research*. 1966(14):1-38.
63. French DK. National survey of family growth, cycle I: sample design, estimation procedures, and variance estimation. *Vital and Health Statistics. Series 2, Data Evaluation and Methods Research*. 1978(76):1-32.
64. Atkinson S, Bryan M, Anderson G. Human milk: difference in nitrogen concentration in milk from mothers of term and premature infants. *J Pediatr*. 1978;93(1):67-69.
65. Duncan B, Ey J, Holberg CJ, Wright AL, Martinez FD, Taussig LM. Exclusive breast-feeding for at least 4 months protects against otitis media. *Pediatrics*. 1993;91(5):867-872.
66. Wright AL, Holberg CJ, Martinez FD, Morgan WJ, Taussig LM. Breast feeding and lower respiratory tract illness in the first year of life. *BMJ*. 1994;37(6):816-821.
67. Dewey KG, Heinig MJ, Nommsen-Rivers LA. Differences in morbidity between breast-fed and formula-fed infants. *J Pediatr*. 1995;126(5):696-702.
68. Duffy LC, Faden H, Wasielewski R, Wolf J, Krystofik D. Exclusive breastfeeding protects against bacterial colonization and day care exposure to otitis media. *Pediatrics*. 1997;100(4):e7-e7.
69. McDowell MM, Wang C-Y, Kennedy-Stephenson J. *Breastfeeding in the United States: findings from the national health and nutrition examination surveys, 1999-2006*. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2008.
70. Centers for Disease Control and Prevention. Breastfeeding Report Card 2016. 2016. <https://www.cdc.gov/breastfeeding/pdf/2016breastfeedingreportcard.pdf>. Accessed August 22, 2016.

71. United States Department of Health and Human Services. *The Surgeon General's call to action to support breastfeeding*. Washington, D.C.: US Department of Health and Human Services, Office of the Surgeon General; 2011.
72. Centers for Disease Control and Prevention. National Immunization Survey 2015; [http://www.cdc.gov/breastfeeding/data/nis\\_data/index.htm](http://www.cdc.gov/breastfeeding/data/nis_data/index.htm). Accessed June 1, 2016.
73. Bartick MC, Schwarz EB, Green BD, et al. Suboptimal breastfeeding in the United States: Maternal and pediatric health outcomes and costs. *Matern Child Nutr*. 2016;13(1):e12366.
74. Bartick M. Breastfeeding and the U.S. economy. *Breastfeeding Med*. 2011;6(5):313-318.
75. Bartick MC, Stuebe AM, Schwarz EB, Luongo C, Reinhold AG, Foster EM. Cost analysis of maternal disease associated with suboptimal breastfeeding. *Obstet Gynecol*. 2013;122(1):111-119.
76. Stuebe A. The risks of not breastfeeding for mothers and infants. *Rev Obstet Gynecol*. 2009;2(4):222-231.
77. Newton NR, Newton M. Relationship of ability to breast feed and maternal attitudes toward breast feeding. *Pediatrics*. 1950;5(5):869-875.
78. Li R, Rock VJ, Grummer-Strawn L. Changes in public attitudes toward breastfeeding in the United States, 1999-2003. *J Am Diet Assoc*. 2007;107(1):122-127.
79. McFadden A, Toole G. Exploring women's views of breastfeeding: a focus group study within an area with high levels of socio-economic deprivation. *Matern Child Nutr*. 2006;2(3):156-168.
80. Li R, Fridinger F, Grummer-Strawn L. Public perceptions on breastfeeding constraints. *J Hum Lact*. 2002;18(3):227-235.
81. Brown A, Raynor P, Lee M. Comparison of health professionals' and mothers' perceptions of factors that influence the decision to breast or bottle feed. *J Adv Nurs*. 2011;67(9):1993-2003.
82. Scott JA, Binns CW. Factors associated with the initiation and duration of breastfeeding: a review of the literature. *Breastfeeding Rev*. 1999;7(1):5-16.
83. Arlotti JP, Cottrell BH, Lee SH, Curtin JJ. Breastfeeding among low-income women with and without peer support. *J Com Health Nurs*. 1998;15(3):163-178.
84. Atchan M, Foureur M, Davis D. The decision not to initiate breastfeeding -- women's reasons, attitudes and influencing factors -- a review of the literature. *Breastfeeding Rev*. 2011;19(2):9-17.

85. DiGirolamo AM, Grummer-Strawn LM, Fein SB. Do perceived attitudes of physicians and hospital staff affect breastfeeding decisions? *Birth*. 2003;30(2):94-100.
86. Schmied V, Beake S, Sheehan A, McCourt C, Dykes F. Women's perceptions and experiences of breastfeeding support: a metasynthesis. *Birth*. 2011;38(1):49-60.
87. Dabrowski GA. Skin-to-skin contact: giving birth back to mothers and babies. *Nurs Wom Health*. 2007;11(1):64-71.
88. DiGirolamo AM, Grummer-Strawn LM, Fein SB. Effect of maternity-care practices on breastfeeding. *Pediatrics*. 2008;122(2):S43-S49.
89. Riordan J, Gill-Hopple K, Angeron J. Indicators of effective breastfeeding and estimates of breast milk intake. *J Hum Lact*. 2005;21(4):406-412.
90. Khoury AJ, Moazzem SW, Jarjoura CM, Carothers C, Hinton A. Breast-feeding initiation in low-income women: role of attitudes, support, and perceived control. *Women Health Iss*. 2005;15(2):64-72.
91. Ahluwalia IB, Morrow B, Hsia J. Why do women stop breastfeeding? Findings from the Pregnancy Risk Assessment and Monitoring System. *Pediatrics*. 2005;116(6):1408-1412.
92. Meedya S, Fahy K, Kable A. Factors that positively influence breastfeeding duration to 6 months: a literature review. *Women Birth*. 2010;23(4):135-145.
93. Ogbuanu CA, Probst J, Laditka SB, Liu J, Baek J, Glover S. Reasons why women do not initiate breastfeeding: a southeastern state study. *Women Health Iss*. 2009;19(4):268-278.
94. Thulier D, Mercer J. Variables associated with breastfeeding duration. *J Obstet Gynecol Neonatal Nurs*. 2009;38(3):259-268.
95. Stein A, Cooper PJ, Day A, Bond A. Social and psychiatric factors associated with the intention to breastfeed. *J Reprod Infant Psych*. 1987;5(3):165-171.
96. Mahoney MC, James DM. Predictors of anticipated breastfeeding in an urban, low-income setting. *J Fam Practice*. 2000;49(6):529-529.
97. Kachoria R, Moreland JJ, Cordero L, Oza-Frank R. Trends in breastfeeding initiation, continuation, and exclusivity by maternal prepregnancy weight: 2004–2011. *Obesity*. 2015;23(9):1895-1902.
98. O'Brien M, Buikstra E, Hegney D. The influence of psychological factors on breastfeeding duration. *J Adv Nurs*. 2008;63(4):397-408.
99. Leff EW, Gagne MP, Jefferis SC. Maternal perceptions of successful breastfeeding. *J Hum Lact*. 1994;10(2):99-104.



100. Bentovim A. Shame and other anxieties associated with breast-feeding: a systems theory and psychodynamic approach. In *Breastfeeding and the Mother*. Amsterdam, NTD: Elsevier; 1976:159-178.
101. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev*. 1977;84(2):191.
102. Bandura A. Guide for constructing self-efficacy scales. In Pajares F, Urdan TC, ed. *Self-efficacy Beliefs of Adolescents*. Charlotte, NC: Information Age Publishing, 2006:307-337.
103. Pajares F, Hartley J, Valiante G. Response format in writing self-efficacy assessment: greater discrimination increases prediction. *Meas Eval Couns Dev*. 2001;33(4):214.
104. Kloeblen-Tarver AS, Thompson NJ, Miner KR. Intent to breast-feed: the impact of attitudes, norms, parity, and experience. *Am J Health Behav*. 2002;26(3):182-187.
105. Hackman NM, Schaefer EW, Beiler JS, Rose CM, Paul IM. Breastfeeding outcome comparison by parity. *Breastfeeding Med*. 2015;10(3):156-162.
106. Connolly C, Kelleher CC, Becker G, Friel S, Gabhainn SN. Attitudes of young men and women to breastfeeding. *Irish Med J*. 1997;91(3):88-89.
107. Fitzpatrick C, Fitzpatrick P, Darling M. Factors associated with the decision to breast-feed among Irish women. *Irish Med J*. 1994;87(5):145-146.
108. Greene J, Stewart-Knox B, Wright M. Feeding preferences and attitudes to breastfeeding and its promotion among teenagers in Northern Ireland. *J Hum Lact*. 2003;19(1):57-65.
109. Hoddinott P, Kroll T, Raja A, Lee AJ. Seeing other women breastfeed: how vicarious experience relates to breastfeeding intention and behaviour. *Matern Child Nutr*. 2010;6(2):134-146.
110. Bar-Yam NB, Darby L. Fathers and breastfeeding: a review of the literature. *J Hum Lact*. 1997;13(1):45-50.
111. Freed GL, Fraley JK, Schanler RJ. Accuracy of expectant mothers' predictions of fathers' attitudes regarding breast-feeding. *J Fam Practice*. 1993;37(2):148-153.
112. Littman H, Medendorp SV, Goldfarb J. The decision to breastfeed the importance of fathers' approval. *Clin Pediatr*. 1994;33(4):214-219.
113. Grassley J, Eschiti V. Grandmother breastfeeding support: what do mothers need and want? *Birth*. 2008;35(4):329-335.

114. Pilkauskas N. Breastfeeding initiation and duration in coresident grandparent, mother and infant households. *Matern Child Hlth J.* 2014;18(8):1955-1963.
115. Raj VK, Plichta SB. The role of social support in breastfeeding promotion: a literature review. *J Hum Lact.* 1998;14(1):41-45.
116. Kessler LA, Gielen AC, Diener-West M, Paige DM. The effect of a woman's significant other on her breastfeeding decision. *J Hum Lact.* 1995;11(2):103-109.
117. Haslam C, Lawrence W, Haefeli K. Intention to breastfeed and other important health-related behaviour and beliefs during pregnancy. *Fam Practice.* 2003;20(5):528-530.
118. Bowles BC. Promoting breastfeeding self-efficacy: Fear appeals in breastfeeding management. *Clin Lact.* 2011;2(1):11-14.
119. Moore ER, Coty MB. Prenatal and postpartum focus groups with primiparas: breastfeeding attitudes, support, barriers, self-efficacy, and intention. *J Pediatr Health Car.* 2006;20(1):35-46.
120. Robinson KM, VandeVusse L. African American women's infant feeding choices: prenatal breast-feeding self-efficacy and narratives from a Black feminist perspective. *J Perinat Neonatal Nurs* 2011;25(4):320-328.
121. Kingston D, Dennis CL, Sword W. Exploring breast-feeding self-efficacy. *J Perinat Neonatal Nurs.* 2007;21(3):207-215.
122. Cleveland AP. Personal efficacy beliefs in breastfeeding. *Int J Childbirth Edu.* 1999;14(3):30-35.
123. Blyth R, Creedy DK, Dennis C, Moyle W, Pratt J, De Vries SM. Effect of maternal confidence on breastfeeding duration: an application of breastfeeding self-efficacy theory. *Birth.* 2002;29(4):278-274.
124. Creedy DK, Dennis CL, Blyth R, Moyle W, Pratt J, De Vries SM. Psychometric characteristics of the breastfeeding self-efficacy scale: data from an Australian sample. *Res Nurs Health.* 2003;26(2):143-152.
125. Dai X, Dennis CL. Translation and validation of the breastfeeding self-efficacy scale into Chinese. *J Midwifery Women Health.* 2003;48(5):350-356.
126. Dennis CLE. Identifying predictors of breastfeeding self-efficacy in the immediate postpartum period. *Res Nurs Health.* 2006;29(4):256-268.
127. Henshaw EJ, Fried R, Siskind E, Newhouse L, Cooper M. Breastfeeding self-efficacy, mood, and breastfeeding outcomes among primiparous women. *J Hum Lact.* 2015; 31(3), 511-518.

128. Torres MM, Torres RRD, Rodríguez AMP, Dennis C-L. Translation and validation of the breastfeeding self-efficacy scale into Spanish: data from a Puerto Rican population. *J Hum Lact.* 2003;19(1):35-42.
129. Ingram J. A mixed methods evaluation of peer support in Bristol, UK: mothers', midwives' and peer supporters' views and the effects on breastfeeding. *BMC Preg Childbirth.* 2013;13(1):192.
130. Dennis CL, Heaman M, Mossman M. Psychometric testing of the breastfeeding self-efficacy scale-short form among adolescents. *J Adolesc Health.* 2011;49(3):265-271.
131. Cusson RM. Attitudes toward breast-feeding among female high-school students. *Pediatr Nurs.* 1985;11(3):189-191.
132. Friel JK, Hudson NI, Banoub S, Ross A. The effect of a promotion campaign on attitudes of adolescent females towards breastfeeding. *Can J Pub Health.* 1988;80(3):195-199.
133. Ansari S, Abedi P, Hasanpoor S, Bani S. The effect of interventional program on breastfeeding self-efficacy and duration of exclusive breastfeeding in pregnant women in Ahvaz, Iran. *Int Scholarly Res Notice.* 2014;2014(510793):1-7.
134. Hatamleh W. Prenatal breastfeeding intervention program to increase breastfeeding duration among low income women. *Health.* 2012;4(3):143.
135. Kamran A, Shrifirad G, Mirkarimi SK, Farahani A. Effectiveness of breastfeeding education on the weight of child and self-efficacy of mothers–2011. *J Edu Health Prom.* 2012;1:e11.
136. Noel-Weiss J, Rupp A, Cragg B, Bassett V, Woodend AK. Randomized controlled trial to determine effects of prenatal breastfeeding workshop on maternal breastfeeding self-efficacy and breastfeeding duration. *J Obstet Gynecol Neonatal Nurs.* 2006;35(5):616-624.
137. Hauck Y, Hall WA, Jones C. Prevalence, self-efficacy and perceptions of conflicting advice and self-management: effects of a breastfeeding journal. *J Adv Nurs.* 2007;57(3):306-317.
138. Nichols J, Schutte NS, Brown RF, Dennis C-L, Price I. The impact of a self-efficacy intervention on short-term breast-feeding outcomes. *Health Edu Behav.* 2009;36(2):250-258.
139. Otsuka K, Taguri M, Dennis C-L, et al. Effectiveness of a breastfeeding self-efficacy intervention: do hospital practices make a difference? *Matern Child Hlth J.* 2014;18(1):296-306.

140. Gijssbers B, Mesters I, Knottnerus JA, Kester AD, Schayck CPv. The success of an educational program to promote exclusive breastfeeding for 6 months in families with a history of asthma: A randomized controlled trial. *Pediatr Allergy Immu.* 2006;19(4):214-222.
141. Srinivas GL, Benson M, Worley S, Schulte E. A clinic-based breastfeeding peer counselor intervention in an urban, low-income population interaction with breastfeeding attitude. *J Hum Lact.* 2015;31(1):120-128.
142. McCarter-Spaulding DE, Dennis C. Psychometric testing of the breastfeeding self-efficacy scale-short form in a sample of Black women in the United States. *Res Nurs Health.* 2010;33(2):111-119.
143. Nommsen-Rivers LA, Dewey KG. Development and validation of the infant feeding intentions scale. *Matern Child Hlth J.* 2009;13(3):334-342.
144. Wutke K, Dennis C-L. The reliability and validity of the Polish version of the breastfeeding self-efficacy scale-short form: translation and psychometric assessment. *Int J Nurs Stud.* 2007;44(8):1439-1446.
145. Danawi H, Estrada L, Hasbini T, Wilson DR. Health Inequalities and Breastfeeding in the United States of America. *Int J Childbirth Edu.* 2016;31(1):35-39.
146. Wheeler BJ, Dennis CL. Psychometric testing of the modified breastfeeding self-efficacy scale (short form) among mothers of ill or preterm infants. *J Obstet Gynecol Neonatal Nurs.* 2013;42(1):70-80.
147. Zubaran C, Foresti K, Schumacher M, et al. The Portuguese version of the breastfeeding self-efficacy scale—short form. *J Hum Lact.* 2010;26(3):297-303.
148. Gregory A, Morrison C, Penrose K, Dennis C, MacArthur C. Psychometric assessment of the breastfeeding self-efficacy scale among British women. *Public Health Nurs.* 2008;25(1):278-284.
149. Semenic S, Loiselle C, Gottlieb L. Predictors of the duration of exclusive breastfeeding among first-time mothers. *Res Nurs Health.* 2008;31(5):428-441.
150. Baghurst P, Pincombe J, Peat B, Henderson A, Reddin E, Antoniou G. Breast feeding self-efficacy and other determinants of the duration of breast feeding in a cohort of first-time mothers in Adelaide, Australia. *Midwifery.* 2007;23(4):382-391.
151. United States Department of Labor Wage and Hour Division. Family and Medical Leave Act. 2015; <https://www.dol.gov/WHD/fmla/>. Accessed September 29, 2016.

152. Aluř Tokat M, Okumuř H, Dennis C-L. Translation and psychometric assessment of the breast-feeding self-efficacy scale—short form among pregnant and postnatal women in Turkey. *Midwifery*. 2010;26(1):101-108.
153. Li R, Jewell S, Grummer-Strawn L. Maternal obesity and breast-feeding practices. *The Am J Clin Nutr*. 2003;77(4):931-936.
154. Masho SW, Cha S, Morris MR. Prepregnancy obesity and breastfeeding noninitiation in the United States: an examination of racial and ethnic differences. *Breastfeeding Med*. 2015;10(5):253-262.
155. Caulfield LE, Gross SM, Bentley ME, et al. WIC-based interventions to promote breastfeeding among African-American women in Baltimore: effects on breastfeeding initiation and continuation. *J Hum Lact*. 1998;14(1):15-22.
156. Manstead ASR, Proffitt C, Smart JL. Predicting and understanding mothers' infant-feeding intentions and behavior: testing the theory of reasoned action. *J Pers Soc Psychol*. 1983;44(4):657-671.
157. Quarles A, Williams PD, Hoyle DA, Brimeyer M, Williams AR. Mothers' intention, age, education and the duration and management of breastfeeding. *Matern Child Nurs J*. 1994;22(3):102-108.
158. Losch M, Dungy CI, Russell D, Dusdieker LB. Impact of attitudes on maternal decisions regarding infant feeding. *J Pediatr*. 1995;126(4):507-514.
159. Cronk BC. *How to use SPSS statistics: A Step-By-Step Guide to Analysis and Interpretation*. Abingdon, UK: Routledge; 2012.
160. Nunnally JC, Bernstein I. The assessment of reliability. *Psychometric Theory*. 1994;3(1):248-292.
161. Piñeiro-Albero RM, Ramos-Pichardo JD, Oliver-Roig A, et al. The Spanish version of the prenatal breast-feeding self-efficacy scale: reliability and validity assessment. *Int J Nurs Stud*. 2013;50(10):1385-1390.
162. Oriá MO, Ximenes LB, de Almeida PC, Glick DF, Dennis CL. Psychometric assessment of the Brazilian version of the breastfeeding self-efficacy scale. *Pub Health Nurs*. 2009;26(6):574-583.
163. McCarter-Spaulding D, Lucas J, Gore R. Employment and breastfeeding outcomes in a sample of black women in the United States. *J Nat Black Nurses Assoc*. 2011;22(2):38-45.
164. *IBM SPSS Statistics for Windows, Version 24.0*. [computer program]. Armonk, NY: IBM Corporation; Released 2015.

165. Sharma M, Petosa RL. *Measurement and Evaluation for Health Educators*. Burlington, MA: Jones & Bartlett Publishers; 2012.
166. Tabachnick BG, Fidell LS. *Using Multivariate Statistics, 5th*. Needham Height, MA: Allyn & Bacon: 2007.
167. Shoukri M, Asyali M, Donner A. Sample size requirements for the design of reliability study: review and new results. *Statistical Methods in Medical Research*. 2004;13(4):251-271.
168. DiIorio CK. *Measurement in Health Behavior: Methods for Research and Evaluation. Vol 1*. Hoboken, NJ: John Wiley & Sons; 2006.
169. Green LW, Lewis FM, Mullen PD, Iverson DC. *Measurement and Evaluation in Health Education and Health Promotion*. Houston, TX: Mayfield Publishing Company; 1986.
170. Chen G, Gully SM, Eden D. Validation of a new general self-efficacy scale. *Org Res Meth*. 2001;4(1):62-83.
171. Sherer M, Maddux JE, Mercandante B, Prentice-Dunn S, Jacobs B, Rogers RW. The self-efficacy scale: construction and validation. *Psychol Report*. 1982;51(2):663-671.
172. Wurtele SK. Fetal health locus of control scale: development and validation. *J Consult Clin Psychol*. 1986;54(6):814.
173. Francis JJ, Eccles MP, Johnston M, et al. Constructing questionnaires based on the theory of planned behaviour. *Health Serv Res*. 2004;2-12.
174. Armitage CJ, Conner M. Efficacy of the theory of planned behaviour: A meta-analytic review. *Brit J Soc Psychol*. 2001;40(4):471-499.

APPENDIX A  
REVIEW OF THE CURRENT LITERATURE

The following review will include definitions of human lactation and breastfeeding. Self-efficacy theory and the methods of self-efficacy instrumentation are defined. Breastfeeding self-efficacy and breastfeeding intention are defined along with a discussion of the personal factors that may have an effect on prenatal breastfeeding self-efficacy. A proposed model of prenatal breastfeeding self-efficacy is presented. A thorough discussion of breastfeeding self-efficacy research includes the areas of current breastfeeding self-efficacy instruments and prenatal breastfeeding self-efficacy interventions. A rationale for the need of a valid and reliable instrument that properly characterizes self-efficacy theory for measuring prenatal breastfeeding self-efficacy and predicting breastfeeding intention is provided.

### **Breastfeeding as an Infant Feeding Method**

Lactation, the producing and expressing of breast milk, is a characteristic unique to mammals and allows for the provision of an ideal food for infants throughout the year, regardless of the season.<sup>56</sup> Breastfeeding is when a child is receiving breast milk as food, either directly from the breast or expressed by other means, such as with a breast pump or by hand expression.<sup>1</sup> Breast milk acts as a natural extension of life from the mother after the child exits the womb.

#### *History*

The early 20<sup>th</sup> century saw a shift in the attitudes and practices of Americans with regard to breastfeeding. Factors that contributed to this shift away from breastfeeding included early women's rights, the increased social value of children, the emergence of a new middle class that appreciated science and what was best for their children, advances in the science and medical support of scientific infant feeding, and the introduction of infant formula.<sup>57</sup> Women who understood the importance of the advances in medicine and science had become more open to the directions provided by their physicians. Physicians at that time wanted mothers to



understand how to follow their directions, but not be so informed on the problem that they could interfere with the physicians' plan of treatment.<sup>57</sup> This increase in physician guidance led to more mothers delivering children in hospitals and not at home. Hospital practices kept the contact between mother and child to a minimum during the first week or more after birth; as little as a few minutes every four hours and no contact during the night. The process of establishing successful breastfeeding was growing more and more difficult for mothers during this time.<sup>58</sup>

The 1930s and 1940s brought a new wave of independent women who found breastfeeding to be old fashioned and time consuming to busy mothers. It was also during this time that breasts were being seen as sexual objects rather than a source of infant feeding and nutrition.<sup>58</sup> Mothers also had the means to sterilize formula bottles at home for greater convenience. The picture of a truly modernized household of 1950s American culture included the bottle-fed infant.<sup>59</sup> A second wave of feminism in the 1960s brought the ideal of rejecting motherhood altogether in an attempt to minimize gender differences to seek social and political liberation.<sup>60</sup> The breastfeeding initiation rate in the United States (U.S.) dropped from 70% in the 1930s to 38% in 1965 to an all-time low of 28% in 1970.<sup>61-63</sup>

In the 1970s, breastfeeding research identified the macronutrient composition of human milk and its benefits.<sup>64</sup> Breastfeeding initiation rates in the U.S. began to rise again and were recorded at 61% in 1984.<sup>59</sup> The late 1980s saw the documentation of decreased diagnosis of otitis media and respiratory illness in infants who were breastfed.<sup>65,66</sup> Dewey and colleagues<sup>67</sup> and Duffy and colleagues<sup>68</sup> confirmed babies in the United States had less gastrointestinal illness than formula fed infants in the late 1990s.

From that point in time, breastfeeding initiation rates in the U.S. increased from 60% in 1994 to 77% in 2006.<sup>69</sup> The U.S. Department of Health and Human Services Office of Disease

Prevention and Health Promotion established Healthy People initiatives in 1990 to set national goals to improve the health of the American people.<sup>11</sup> New Healthy People objectives are set for the nation every ten years. Based on the initiation rate recorded in 2006, it was clear the rate had exceeded the Healthy People 2010 initiation goal of 75%. That goal increased for the Healthy People 2020 objectives to 81.9%, and as of the most recently published data on initiation rates from babies born in 2013, 81.1% of infants are ever breastfed in the United States.<sup>11,70</sup>

### *Professional Recommendations for Breastfeeding*

Multiple organizations and agencies who support medical, nutrition, and infant feeding professionals in the United States have released and maintained policy or position statements regarding the support of breastfeeding. Each organization states in writing the recommendations for breastfeeding they feel members should follow and support in their professional work with mothers and infants. The American Congress of Obstetricians and Gynecologists<sup>6</sup>, the American Academy of Pediatrics<sup>7</sup>, the Academy of Nutrition and Dietetics<sup>8</sup>, the American Academy of Family Physicians<sup>9</sup>, the Academy of Breastfeeding Medicine<sup>5</sup>, and the United States Breastfeeding Committee<sup>4</sup> suggest recommending to new mothers exclusive breastfeeding for the first six months of an infant's life with continued breastfeeding with complimentary foods to one year or longer.

Breastfeeding should not be recommended to mothers who have certain medical diagnoses or have chosen to partake in certain life-threatening lifestyle activities including the use of illicit drugs. Mothers who have been diagnosed with Human Immunodeficiency Virus (HIV), active tuberculosis, herpes simplex on the breasts with active lesions, and human T-cell lymphotropic virus type 1 or type 2 should not breastfeed.<sup>7,71</sup> Mothers who have been ordered to

take antimetabolites, undergo chemotherapy or radiation therapy are also asked to refrain from breastfeeding. Infants who have been diagnosed with galactosemia, the inability to process galactose and use it as energy in the body, should not be breastfed.<sup>71</sup>

### *Current Rates of Breastfeeding*

The 2016 Breastfeeding Report Card<sup>70</sup> reported rates of breastfeeding initiation, duration and exclusivity for babies born in 2013 (Table 6) in the U.S. from the National Immunization Survey (NIS). In 2013, 81.1% were ever breastfed, 44.4% were exclusively breastfed for at least the first three months of life, and 22.3% were exclusively breastfed for at least the first six months of life. The Pacific Northwest states of the U.S. (Washington, Oregon, Idaho, Montana) had the highest rates ( $\geq 59\%$ ) of breastfed infants at 6-months of age while the Southeastern states (Louisiana, Mississippi, Alabama, Arkansas) had the lowest rate or 30.1%.<sup>70</sup> Disparities exist, indicated by 61.6% of black, 81.1% of white and 83.8% of Hispanic women initiating breastfeeding.<sup>72</sup>

**Table 6.** Breastfeeding Percentage Rates in the United States among Babies Born in 2013 Compared to Healthy People 2020 Objectives

	Initiation	Exclusive BF to 3 Months	Any BF to 6 Months	Exclusive BF to 6 Months
U.S. Nation <sup>70</sup>	81.1%	44.4%	51.8%	22.3%
Healthy People Target <sup>11</sup>	81.9%	46.2%	60.6%	25.5%

### *Costs to Society*

The costs incurred from suboptimal breastfeeding rates in the United States are severe. In 2014, more than 3 billion dollars per year were spent on total medical costs for mothers and babies. Another 1.3 billion spent on non-medical costs due to a high diagnosis rate of medical conditions that can be lessened or avoided with breastfeeding. If 90% of U.S. mothers could

comply with current recommendations to breastfeed exclusively to six months of age, the economy could save as much as 604 million dollars in pediatric health costs each year and infant formula spending would decrease by 3.9 billion dollars per year.<sup>73,74</sup> Over 859 million dollars in direct and indirect costs due to maternal morbidity could be avoided if 90% of U.S. mothers breastfed their children for at least the first year of life.<sup>75</sup> Decreased incidence of diseases such as breast and ovarian cancer were seen among women who breastfed a total of 12 to 18 months in their lifetime compared to women who never breastfed.<sup>76</sup>

### *Benefits*

There are many benefits to breastfeeding.<sup>10</sup> The Academy of Nutrition and Dietetics (AND) and the American Academy of Pediatrics (AAP) report in position and policy statements the benefits to the infant that include, but are not limited to, optimal nutrition for the infant, strong bonding with the mother, safe and fresh milk, enhanced immune system, and promotion of correct development of jaw and teeth. Breastfed infants may also experience a reduced risk for gastroenteritis, asthma and severe lower respiratory tract infections, allergies and intolerances, infant morbidity and mortality, and obesity and diabetes. Benefits for the mother include a strong bond with the infant, increased energy expenditure and weight loss to pre-pregnancy weight, increased contracting and shrinking of the uterus to pre-pregnancy size, time saved from preparing formula, money saved from not buying formula, and possible decreased medical expenses for the child. Breastfeeding mothers may also experience decreased risk for breast and uterine cancer, Type II diabetes, and post-partum depression.<sup>8,77</sup>

There are also global environmental benefits of breastfeeding. Human milk is a renewable, complete source of nutrition for infants for the first six months of life. The packaging

required to sell and prepare infant formula is nearly non-existent with breastfeeding. Also, the formula industry creates a carbon footprint through the manufacturing and transporting of human milk substitute to retail outlets.<sup>71</sup>

### *Barriers to Initiation*

Women choose to not initiate breastfeeding because of a lack of knowledge about the benefits of breastfeeding and the shortcomings of infant formula. Many Americans believe formula is equivalent to breast milk with regard to its benefits, which is incorrect.<sup>12,78</sup>

First time mothers, nulliparous women, who lack any breastfeeding experience and multiparous women with little to no experience with breastfeeding previous children were more likely to express negative attitudes towards the physical act of breastfeeding and cite this as a reason to not breastfeed. Some women expect it to be easy and face challenges they cannot overcome or expect the experience to be difficult and avoid trying it altogether.<sup>79</sup> Fear of what to expect may lead to low levels of confidence in mothers, starting early in the prenatal period. The belief that breastfeeding was too time consuming and that a mother must give up her current lifestyle in order to be successful was viewed as a threat to a mother's independence.<sup>80</sup> The echoing of breastfeeding concerns by influential others (family, friends, health professionals, etc.) exacerbates the matter and further lowers confidence to overcome those fearful issues.<sup>81</sup>

The attitudes friends and family have toward breastfeeding may affect feeding choice. The father plays a key role in the decision. A father may express negative feelings toward breastfeeding, concern about less opportunities for infant bonding through not personally feeding the child, or concern about the mother returning to her pre-infant household role in a timely fashion, which may influence the mother's infant feeding decisions and actions.<sup>16,82</sup> If peers do

not support breastfeeding, it may prevent a woman from choosing to breastfeed. A personal story of a negative experience with breastfeeding from a family member or a friend may be the catalyst for a mother to avoid breastfeeding altogether.<sup>13,83</sup>

Health care professionals can be either a positive or negative source of information and support when attempting to initiate breastfeeding.<sup>84-86</sup> This information and support would depend on the level of experience working with breastfeeding mothers, the depth of breastfeeding knowledge, and if the advice and support is accurate and consistent over time.<sup>16</sup> Mothers who were separated from their infant shortly after birth and for prolonged durations during the hospital stay were less likely to initiate breastfeeding. It is predicted that only 57% of hospitals in the United States allow mothers to keep the infant in the room with them at all times throughout the hospital stay, a practice known as “rooming-in.”<sup>87-89</sup>

Breastfeeding in public may deter a mother from choosing to breastfeed altogether in order to avoid any embarrassment. This fear of embarrassment is not limited to just feeding in public, but could also be felt within the home space or in private areas with those within a social circle. A woman may feel she could be limited in her social interactions if she refuses to feed in front of others and may choose to not breastfeed at all.<sup>18,82,90</sup>

Women were less likely to initiate breastfeeding if they smoke, were less than 25 years of age, not married, had less than a high school education, were black or African-American, or were of low socioeconomic status.<sup>91-96</sup> Pre-pregnancy weight status has emerged as a barrier to breastfeeding initiation. Research has shown that women who are either underweight or obese before they become pregnant were less likely to initiate breastfeeding compared to normal weight women.<sup>19</sup>

Employment affects breastfeeding initiation. A mother who must return to work shortly after birth due to insufficient maternity leave time may choose to formula feed out of convenience. Women who intended to return to work within the first year of a child's life were less likely to initiate breastfeeding than women who do not return to work within the first year.<sup>20,21</sup>

### *Barriers to Duration*

A desired duration (total length of time) to breastfeed may be decided upon when a mother sets her intention to initiate breastfeeding. Factors such as pre-pregnancy weight status, returning to work or school, family expectations, breastfeeding issues, perceived milk supply, confidence level, and personal motivation may influence breastfeeding duration.<sup>13,14,16,20,21,83,91,92,94,97,98</sup>

Exclusive breastfeeding rates and durations were higher among women who were of normal weight and overweight before pregnancy, while durations and exclusivity rates were lower among obese women.<sup>97</sup> Women who work full-time were more likely to breastfeed to shorter durations than part-time or unemployed mothers.<sup>20,21</sup> Breastfeeding mothers who return to work were faced with issues such as inadequate break time, and limited or no availability of a private location to pump milk, lack of proper storage space for expressed milk, and little to no access to nearby child care.<sup>21,22,83,90</sup>

Close family and friends may have an effect on how long a woman breastfeeds her child. If those close to a mother disagree on the appropriate duration for breastfeeding, she may avoid going to her family and friends for help with breastfeeding issues.<sup>17</sup> Issues included leaking milk, nipple and breast pain, engorged breasts, mastitis, and the failure of the infant latching to the breast for proper feeding. Women may experience one or more of these issues early in the

postpartum period and if family assistance or professional help is unavailable or not sought after, could lead to weaning and discontinuation.<sup>13,14</sup> Early weaning, is the transition of infant feeding from breast milk to formula before the intended duration of breastfeeding is completed.<sup>90</sup>

The concern for, or belief of, insufficient milk supply was also a major factor in the early cessation, or discontinuing, of breastfeeding.<sup>13,83</sup> Two studies identified low maternal confidence to be significantly related to perceived insufficient milk supply, a major reason women chose to discontinue breastfeeding earlier than desired.<sup>39,41</sup> Women with low maternal confidence were 3.1 times more likely to discontinue breastfeeding in the early postpartum period compared to women who were very confident.<sup>40</sup> A similar study found that only 5% of women with high confidence discontinued breastfeeding within the first week postpartum compared to 27% of women with low confidence.<sup>38</sup>

Despite these barriers, the act of breastfeeding, the eliciting of an emotional response, and the feelings of attachment to the baby may represent the attainment of maternal breastfeeding success.<sup>99</sup> The emotional responses from breastfeeding may extend past the strong bond with the child into areas of the mothers personal and social environment.<sup>100</sup> High perceptions of overcoming possible barriers and high confidence in performing the act of breastfeeding was significantly associated with breastfeeding to an intended length of time.<sup>98</sup>

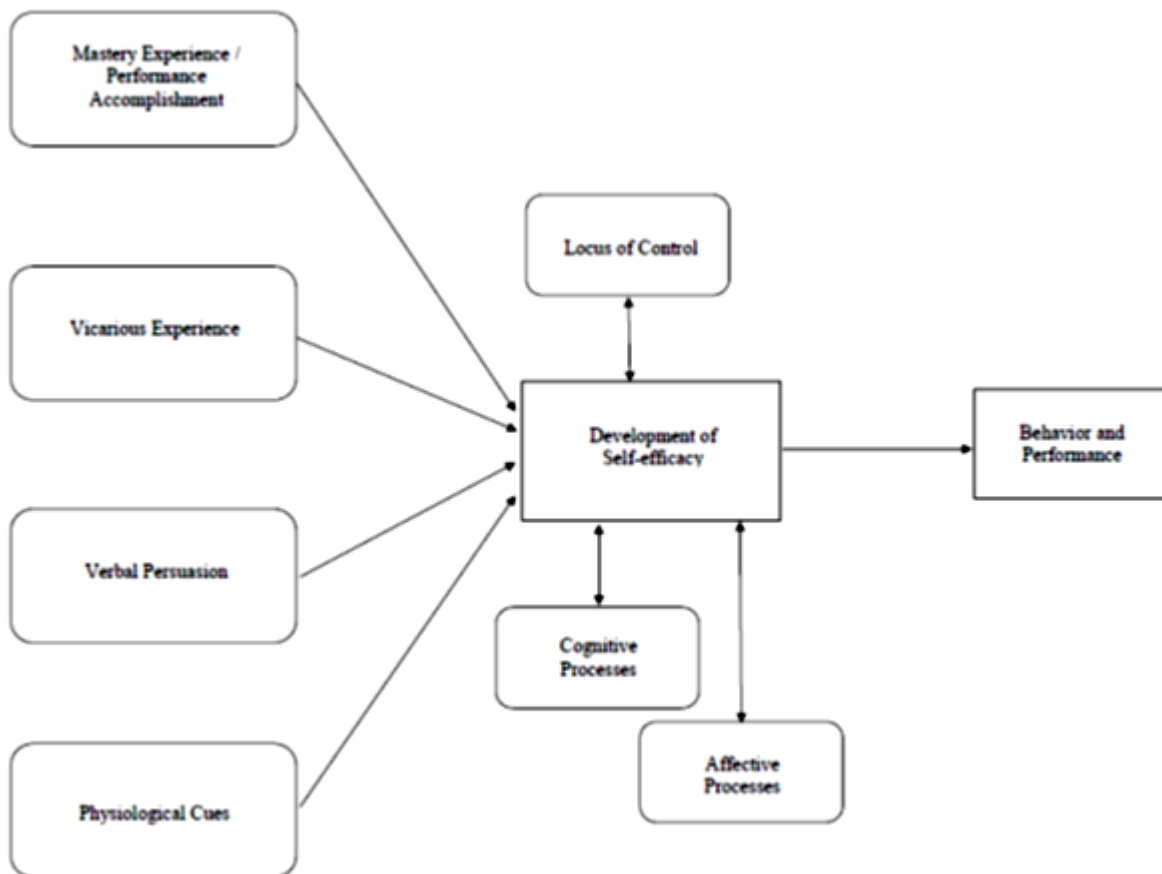
### **Self-efficacy Theory**

Self-efficacy theory<sup>28</sup> helps to explain the choosing and maintaining of health behaviors. The theory proposes that people will generally only attempt behaviors they believe they can accomplish and will avoid the behaviors where they will not be successful. Bandura<sup>28</sup> theorized that people with a high level of self-efficacy believe they can accomplish difficult tasks and see them as challenges to master and not threats to avoid.



Self-efficacy theory proposes that self-efficacy is influenced by four main antecedents: performance accomplishment, vicarious experience, verbal persuasion, and physiological responses (see Figure 2).<sup>33,101</sup> Performance accomplishment, otherwise known as mastery experience, is the successful completion of something that is similar or related to the new behavior one may take on. Successful completion of the similar activity may improve confidence and increase the belief that one may be successful taking on the new behavior.<sup>28</sup> Key opportunities for people to gain mastery experience in a particular area include workshops, classes, and training programs. One must also progress through activities and attempt those that are more and more difficult in order to build a stronger sense of self-efficacy for the behavior.<sup>53</sup>

**Figure 2.** Self-efficacy Theory



A person can gain vicarious experience through watching another person, like themselves, complete or act out the behavior of interest successfully. Through this process of observing the success and failures of those “modeling” the behavior, a person may increase or decrease their level of self-efficacy for the behavior. Workshops, classes, and training programs may also provide opportunities for people to view others modeling the behavior through the use of videos, pictures, or live performance.<sup>53</sup>

Verbal persuasion is the words of encouragement in regard to a new behavior received from other people. Positive verbal support helps to maintain the belief that one can carry out the behavior and may lead to increased self-efficacy. Conversely, negative verbal persuasion from others to avoid or give up trying to attempt the behavior may lead to decreased confidence and self-efficacy to carry out the behavior.<sup>53</sup>

Physiological responses are the somatic (physical) and emotional states that occur when a person is contemplating taking on a new behavior. The types of responses occurring are clues to the likelihood of success or failure. Decreased self-efficacy may occur if thoughts are causing increased stress, anxiety, and doubt in the ability to cope with the behavior and any issues that may arise. If one believes, despite these possible stressful issues that one can cope and overcome them, it is a sign of high self-efficacy for the behavior. Again, workshops, classes, and training programs can provide opportunities to tap into those thoughts and emotions and provide solutions to cope and overcome possible issues that may arise.<sup>53</sup>

Key attributes of self-efficacy theory also include cognitive processes such as goal setting and visualization of success, affective processes such as beliefs and emotions, and locus of control.<sup>32</sup> Efficacious people set goals and maintain a commitment to them, even in the face of possible failure. Approaching difficult situations with confidence and control may reduce stress

or the risk of depressive symptoms in life. Conversely, people who view difficult situations as threats will avoid them because they feel there are too many weaknesses or obstacles to overcome. Being quick to give up or avoid a situation completely causes one to lose faith in their capabilities which could lead to increased stress and risk of depression.<sup>28</sup>

Locus of control refers to one's perception about what actually causes the events in life to happen. People believe that the events in life are either controlled by destiny or external forces, such as fate, blessing, and powerful others, or that the events are caused by internal forces, such as personal decisions and concentrated efforts. Whether one's beliefs are internal or external exhibits a strong influence over decisions regarding health. Depending on the situation or behavior in question, where one falls on the continuum of internality and externality can vary. Behaviors that are very personal, like taking steps to prevent a disease or improve one's health, are carried out by those who are more internally controlled. Externally controlled individuals will avoid behaviors to intentionally protect themselves from harm with the belief that "if it's my time, it's my time."<sup>53</sup>

Mastery experience, vicarious experience, verbal persuasion, and physiological responses all effect the level of self-efficacy a person may have towards a new behavior, positively and negatively. Cognitive and affective processes are carried out in an attempt to manage self-efficacy, with locus of control helping to better display the belief in who or what really has control over the new behavior, fate or personal action. The level of self-efficacy for a behavior affects the decision to actually engage in the behavior.<sup>52,53</sup>

### **Constructing Instruments to Measure Self-efficacy**

Perceived self-efficacy for a behavior cannot be measured with a universal instrument. Efficacy beliefs for different behaviors are multifaceted under the umbrella of the antecedents

and attributes of self-efficacy theory. The behavior in which self-efficacy is to be measured must be analyzed to reveal relevant domains of functioning – what behavioral factors exist that one would encounter in preparing to take on the new behavior? Including factors that are not related to the current state of the behavior, (such as possible future situations after the behavior is initiated) that one cannot judge in the present (due to not currently acting out the behavior), will lessen any predictive relationship between the relevant factors and the intention to perform that behavior.<sup>102</sup>

Self-efficacy scales are appraisals of individual perception of handling task demands of preparing to take on a behavior that varies in level of difficulty. There must be tasks or factors that one would have to “overcome” or the behavior may be viewed as simple and all persons may record highly efficacious scores on the scale. Those challenges are determined by a thorough analysis of the barriers to preparing for and initiating the behavior. The items should not strictly reflect only those factors that may be perceived as ultimately challenging; the scale must maintain an even distribution of tasks that would fall uniquely on each responder’s continuum of perceived difficulty.<sup>102</sup>

Items on an instrument to measure perceived capability of undertaking a behavior should be worded as “I can do” or “I will do” to reflect judgement of capability and the intention to perform. The scale must contain items of predictive utility in order to provide insight on how one may perceive their management of preparing for and initiating the behavior. Bandura<sup>102</sup> suggests that the response scales use a 100-point scale, ranging in 10-unit intervals from 0 (“Cannot do”); through 50 (“Moderately can do”); to 100 and complete assurance (“Highly certain can do”). The 0 – 100 scale format is a stronger predictor of performance than narrower

response formats such as a 5-item Likert-type scale.<sup>103</sup> Items that reflect the measurement of locus of control should be contained in a separate scale on a survey since the phenomena of whom or what controls the outcomes in life is different from perceived efficacy for a behavior.<sup>102</sup>

### **Prenatal Breastfeeding Self-efficacy**

Belief that the outcome of acting out a new behavior will be positive does not necessarily result in performance unless there is also the belief in acting out the behavior successfully. A mother deciding to breastfeed must not only understand the benefits of breastfeeding, but must also believe she can be successful at doing so.<sup>43</sup> Preparation in the prenatal period is key to building confidence through the antecedents of self-efficacy theory.

Performance accomplishment, or mastery experience, is achieved through the successful completion of something that is similar or related to breastfeeding a child. Completion of prenatal breastfeeding classes, support groups, workshops, or speaking with a health professional or lactation counselor may help to increase knowledge, positive attitudes, and mastery of introductory skills, such as holding a baby to breast or recognizing infant feeding cues.<sup>104</sup> A mother who has previously breastfed a child would have mastery experience of the actual behavior which may lead to high self-efficacy for breastfeeding the next child.<sup>105</sup>

Vicarious experience gained in the prenatal period may have an influential effect on breastfeeding self-efficacy. Seeing or watching other women breastfeed, especially those who appear to look similar, has led to more positive attitudes about breastfeeding in samples of women in several studies.<sup>106-108</sup> Seeing other women breastfeed can start at an early age if a woman was raised in a breastfeeding home or had opportunities to view other family members and friends breastfeed their infants.<sup>109</sup> Viewing others model breastfeeding behaviors and in turn replicating what one is seeing also helps to gain mastery experience.

The influence of other persons and children in the household may affect the attitudes and beliefs a woman has about breastfeeding. Expressed negative opinions about breastfeeding by the child's father,<sup>84,110-112</sup> the mother's partner, the family, or friends may dissuade a mother to choose breastfeeding over bottle feeding.<sup>113-115</sup> Mothers with less breastfeeding experience were more likely to seek out information and advice about breastfeeding from significant others.<sup>104,116</sup> Positive verbal persuasion to pursue and prepare for breastfeeding from other people may increase a woman's confidence and self-efficacy to breastfeed her child.<sup>43</sup>

Physiological responses, such as the current emotional and physical state, including the presence of any stress, anxiety, fatigue, pain, or depression may influence a mother's attitude about infant feeding and how she evaluates her ability to breastfeed. Individual stress or anxiety may stem from thoughts about keeping up with the demand of breastfeeding, the desire to have one's body back to oneself after birth, current lifestyle choices, and the need to return to work or school.<sup>26,93</sup> Through the combination of obtaining mastery experience, viewing others engage in breastfeeding, and having positive verbal persuasion from others may help to alleviate stress, anxiety, depression or fear associated with initiating breastfeeding.<sup>43</sup>

Cognitive processes of self-efficacy theory are engaged through visualizing success and setting goals to be successful with breastfeeding. Affective processes include having belief in one's ability to breastfeed and having a plan to manage threats that may arise throughout the pregnancy that may affect the decision to breastfeed. Increased assurance to overcome possible threats or barriers and higher confidence in performing the act of breastfeeding has been positively associated with intention and initiation of breastfeeding.<sup>98</sup>

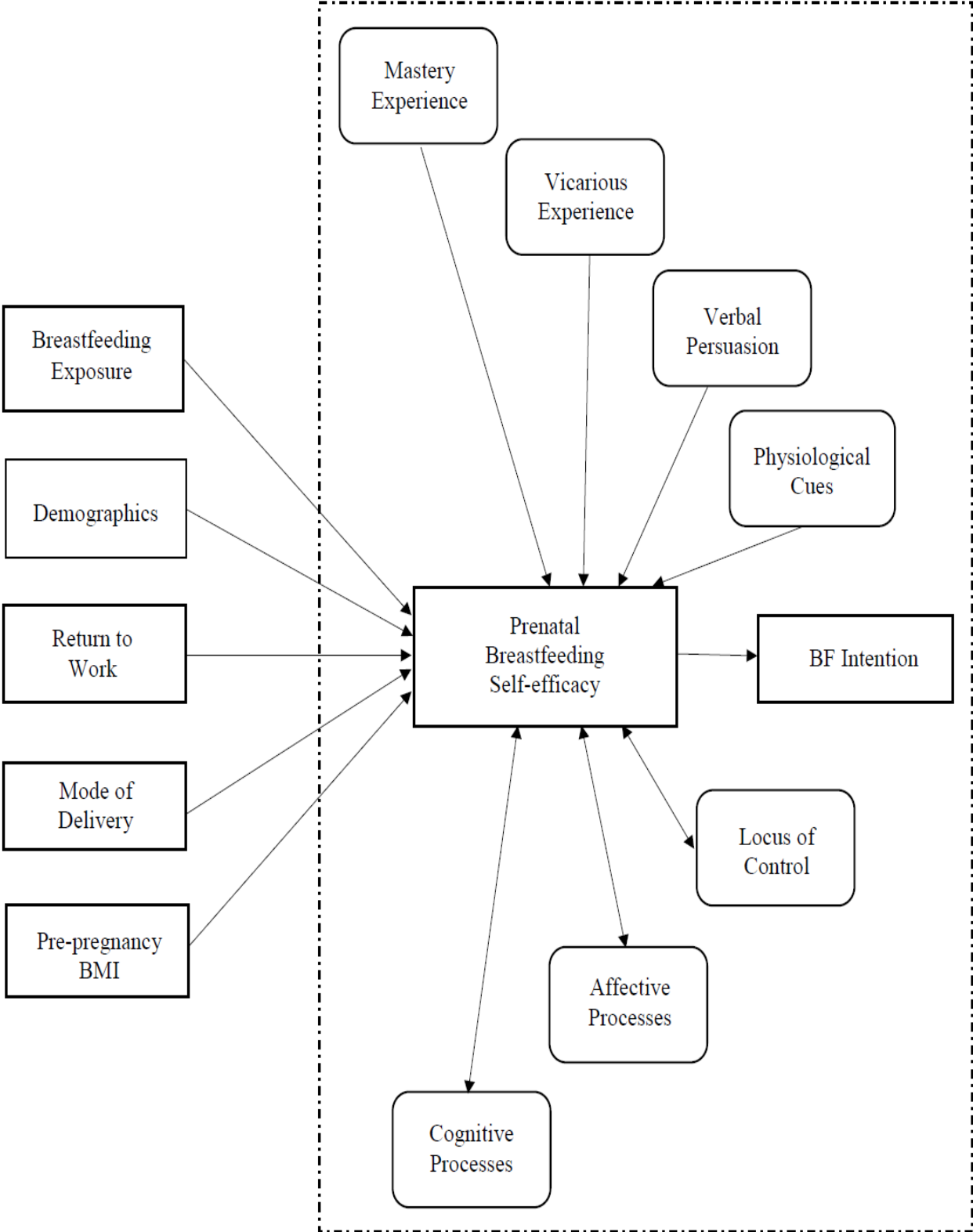
Locus of control, with regard to breastfeeding, represents a woman's belief that either fate, or her own personal power over the events in her life, may affect the child's health and the ability to breastfeed her child.<sup>117</sup> These beliefs stem from each of the environments she has contact with during the pregnancy. The main environment is centered on the mother herself and those closest to her. Perceived locus of control over the health of the baby may stem from belief of powerful others, or fate, or from the belief that she is in control of the outcome of the pregnancy. High, internal fetal health locus of control, or a high sense that a mother has strong personal control over the health of the unborn baby, has been shown to be significantly associated with higher rates of breastfeeding intention and initiation.<sup>117</sup>

Prenatal factors that may affect breastfeeding self-efficacy in a negative way that are related to the antecedents of self-efficacy include: fear of failure,<sup>118</sup> uncertainty of what to expect,<sup>119,120</sup> lack of observational learning opportunities,<sup>43,120</sup> previous negative breastfeeding experience,<sup>121</sup> limited availability of professional breastfeeding support,<sup>119</sup> and low level of breastfeeding knowledge.<sup>122</sup>

### **Proposed Model of Prenatal Breastfeeding Self-efficacy**

Understanding the association between the personal factors a pregnant woman may have, their subsequent effect on self-efficacy and its attributes, and how self-efficacy predicts intention to breastfeed may be best represented with a new model of prenatal breastfeeding self-efficacy. The model (see Figure 3) would measure the strength of influence each personal factor and each of the 4 antecedents has on self-efficacy. It would also measure the reciprocal influence the 3 attributes may have on self-efficacy. Ultimately, the model would predict breastfeeding intention based on the level of self-efficacy measured.

**Figure 3.** Model of Prenatal Breastfeeding Self-efficacy





*Self-efficacy and Personal Factors*

**Table 7.** Operationalized List of Specific Personal Factors

<b>Model Category</b>	<b>Specific Factors</b>
Breastfeeding Exposure	Parity Prior experience Breastfed as a child Breastfeeding education exposure
Demographics	Age Education Marital Status Race/Ethnicity WIC/SNAP/Medicare
Return to Work	Postpartum return to work plan Length of maternity leave
Mode of Delivery	Vaginal birth or Cesarean section
Pre-pregnancy BMI	Pre-pregnancy height and weight

Multiple studies have shown that a pregnancy with a first child may have a negative effect on the level of breastfeeding self-efficacy prior to birth.<sup>42,123-128</sup> The infant feeding decision can also be influenced by the expectation of family to return to the household and resume daily duties without much distraction from the child.<sup>93</sup> Differences between nulliparous and multiparous mothers' prenatal breastfeeding self-efficacy measurements (regardless of breastfeeding experience) are not found in the literature to date. The experience of having

breastfed a previous child appears to significantly influence prenatal breastfeeding self-efficacy with higher scores recorded among experienced mothers compared to mothers with no breastfeeding experience.<sup>46,129</sup>

Research has shown that pregnant mothers were influenced to consider breastfeeding if they were breastfed themselves by their own mothers.<sup>130</sup> A positive attitude and knowledge about breastfeeding among pregnant women has been shown to be due to more exposure to breastfeeding mothers.<sup>131,132</sup>

Several interventions testing the effects of prenatal breastfeeding education methods on breastfeeding self-efficacy have been completed. The breastfeeding programs were carried out in a variety of settings and modalities: class or workshop,<sup>133-136</sup> journal or workbook,<sup>137-139</sup> home visit education,<sup>129,140</sup> and peer counseling.<sup>141</sup> Of the nine interventions that assessed breastfeeding self-efficacy with a valid scale, 66% (n=6) showed significantly higher increases in total self-efficacy scores in the intervention group compared to the control group.<sup>133-136,138,139</sup>

Research has shown the negative effect marital status, age, education level, and race/ethnicity may have on breastfeeding initiation.<sup>23-26</sup> Further research showed no significant effect of marital status, age, or education level on breastfeeding self-efficacy when measured in the prenatal period.<sup>46,120</sup> Two studies that found a significant difference in breastfeeding self-efficacy based on race and ethnicity were completed among samples that were comprised of a high percentage of black or African-American women.<sup>46,120</sup> There appeared to be no significant difference in postpartum breastfeeding self-efficacy based on marital status,<sup>42,130,142-144</sup> age,<sup>42,123,130,143,145-148</sup> education level,<sup>42,130,143,146,148</sup> or ethnicity.<sup>42,130,143,145,146</sup>

Qualification for programs such as the Supplemental Nutrition Program for Women, Infants, and Children (WIC), the Supplemental Nutrition Assistance Program (SNAP), and

Medicaid health insurance are all based on the income level of the individual or household. Persons who qualify for such programs are categorized as being of low income. Studies have mixed results with one indicating that income level did not have a significant effect on self-efficacy,<sup>42</sup> while a second study concluded that family income was significantly correlated with self-efficacy and breastfeeding intention.<sup>44</sup>

Self-efficacy decreases when women return to work. In a sample of pregnant African-American women, a major obstacle cited among those with low self-efficacy was having a workplace without any breastfeeding policies in place and being unsure if breastfeeding could continue after returning to work.<sup>120</sup> Studies examining the effect of a mother's plan to return to work on prenatal breastfeeding self-efficacy in other populations are not currently available in the literature.

Studies on breastfeeding self-efficacy and initiation completed in countries such as Canada<sup>149</sup> and Australia,<sup>150</sup> who have maternity leave times as long as six months to one year, do not adequately reflect how leave time may affect the self-efficacy levels of women in the U.S. Maternity leave time allowed under the Family and Medical Leave Act of 1993 in the United States is 12 weeks.<sup>151</sup> Studies measuring the direct effect maternity leave time has on prenatal breastfeeding self-efficacy have yet to be completed.

The mode of delivery may have an effect on breastfeeding self-efficacy. Two studies found no significant difference in postpartum breastfeeding self-efficacy scores between women who gave birth vaginally and those who had a cesarean delivery.<sup>146,152</sup> However, Wutke and Dennis<sup>144</sup> found that there was a significant difference between the two modes of delivery and postpartum self-efficacy levels in a sample of Polish women, with similar results also found among a sample of Canadian women.<sup>42</sup>

There is a gap in the literature on how pre-pregnancy weight status may affect breastfeeding self-efficacy in the prenatal period. Research has shown that women with pre-pregnancy body mass index (BMI) within the range of underweight or obese were less likely to initiate breastfeeding than women who had a BMI within the normal weight or overweight range.<sup>19,153,154</sup>

### *Self-efficacy and Breastfeeding Intention*

Intention to breastfeed can be measured objectively, whether or not a mother plans to feed her infant at the breast (i.e. “Just breastfeed/No formula”), or subjectively, a mother’s cognitive reaction to the level at which intention meets expectations (i.e. “how I think or feel about breastfeeding my child in line with my expectations”). Several dimensions of breastfeeding intention, in-line with self-efficacy theory, include belief in performing the physical act itself, exposure to opportunities to observe breastfeeding by others, psychological preparation and management of feelings about breastfeeding, and social aspects such as exposure to other people’s thoughts and feelings about breastfeeding.<sup>104,109</sup>

A woman who set her intention to breastfeed was more likely to actually initiate breastfeeding after birth.<sup>116,155-158</sup> Breastfeeding intention also appeared to directly influence breastfeeding self-efficacy in the prenatal period, with those mothers who had the intention to breastfeed having significantly higher self-efficacy scores than mothers who indicated they did not intend to breastfeed.<sup>46,120</sup>

### **Measurement of Breastfeeding Self-efficacy**

Several theory-based instruments to measure infant feeding attitudes, confidence, breastfeeding intention, and specifically breastfeeding self-efficacy have been created and validated for use among various female populations. The following six instruments are outlined

in Table 2.3. The Infant Feedings Intentions Scale (IFI) scale was created in 2009 by Nommsen-Rivers and Dewey<sup>143</sup> to not only assess self-efficacy, but to also assess the strength of intention to exclusively breastfeed. The 5-item instrument used a 4-point Likert-type scale to assess statements regarding intended method of infant feeding and intended duration of breastfeeding. The instrument had a score range of 0 to 16, with higher scores indicating a stronger intention to breastfeed. This instrument had a reliability coefficient using Cronbach's alpha of .92 and item-to-total correlations from 0.76 to 0.84. The authors hypothesized that the higher the IFI score, the greater the level of breastfeeding self-efficacy. This scale only appeared to measure intention to breastfeed and intended duration. The scale alone did not make a logical connection to confidence or level of self-efficacy to breastfeed since no actual questions to address those areas were part of the instrument.<sup>143</sup>

Cleveland and McCrone,<sup>45</sup> in 2005, created a scale to assess levels of confidence, breastfeeding initiation, and duration among prenatal mothers. Participants who completed the Breastfeeding Personal Efficacy Beliefs Inventory (BPEBI) scale were asked to mark their current level of confidence (*cannot do to certain can do*) with twenty-four "I can..." action statements regarding breastfeeding duration, technique, motivation, environments and possible challenges. This instrument used a visual analog scale in which a tick mark is placed on a 100-millimeter line above the possible answer choices and data was recorded as measured millimeters from 0% to 100%. Higher percent scores indicated a higher level of breastfeeding self-efficacy.<sup>45</sup> This instrument had a reliability coefficient using Cronbach's alpha of .89 and item-to-total correlations from 0.22 to 0.59. The internal consistency of the survey was above the desired criterion of .80 alpha for new instruments.<sup>159</sup> The item-to-total correlation range was considered satisfactory compared to the desired .70 correlation and explained a satisfactory

amount of the variance.<sup>160</sup> The BPEBI scale addressed confidence in relation to managing breastfeeding duration, social support, motivation, environments, and possible challenges. The scale did not address any areas of mastering preparatory skills, verbal persuasion from others, vicarious learning, or coping with physiological cues. The scale did not represent a true self-efficacy theory-based instrument to measure prenatal breastfeeding self-efficacy.

In 2006, another scale to measure breastfeeding self-efficacy among prenatal women was developed by Wells and Colleagues. The Prenatal Breastfeeding Self-efficacy Scale (PBSES)<sup>46</sup> was a shorter instrument than the BPEBI and used a 5-point Likert-type scale with 1 being *not at all sure* and 5 being *completely sure* for twenty “I can...” action statements regarding breastfeeding. Scores can range from 20 to 100, with higher scores indicative of greater levels of breastfeeding self-efficacy.<sup>46</sup> This instrument had a reliability coefficient using Cronbach’s alpha of .89 with the lowest item-to-total correlation being 0.36. All items were satisfactory to adequately correlated with the entire scale.<sup>160</sup> The 4 factors retained were not named by the authors but measure confidence with I) skills and demands, II) information, III) breastfeeding in public, and IV) social pressure. The scale, like the BPEBI, cited the four attributes of self-efficacy theory as the basis of the instrument items, but failed to truly address areas of every attribute to measure prenatal breastfeeding self-efficacy. Factors I and III asked the mother to project her confidence in the future dealing with breastfeeding situations she may never have previously experienced. Factors II and IV had items that adequately assessed a pregnant mother’s confidence with items similar to performance accomplishment, verbal persuasion and physiological cues. Items addressing vicarious experience, locus of control and the cognitive

and affective processes were not part of this instrument. The scale had been translated and validated in Spanish<sup>161</sup>, but has only been cited as being used to measure prenatal breastfeeding self-efficacy in one other English-speaking study<sup>120</sup>.

The Iowa Infant Feeding Intentions Scale (IIFAS)<sup>44</sup> was created in 1999 to assess postpartum maternal attitudes towards infant feeding. The scale was designed with a multi-attribute utility measure that has the participant, through a 17-item scale, rate their agreement with statements that were both pro-breastfeeding and pro-formula feeding to see which feeding method appeared to be preferred.<sup>44</sup> This instrument was tested in three samples of immediate postpartum women (~48 hours) who were mostly white (91-97%). The highest reliability coefficient using Cronbach's alpha was .86 with item-to-total correlations from 0.22 to 0.68. All 17 items were satisfactory to adequately correlated with the entire scale and was a valid predictive instrument of infant feeding choice among women who had recently given birth.<sup>44,160</sup> This scale failed to tap into the area of how much confidence a women had in her preparation for breastfeeding in order to assess any perceived self-efficacy. This scale would not be appropriate for use in establishing levels of breastfeeding self-efficacy in samples of pregnant women.

Dennis and Faux<sup>43</sup> in 1999 created the Breastfeeding Self-efficacy Scale (BSES) to assess levels of breastfeeding self-efficacy in postpartum women and validated the scale among a sample of breastfeeding mothers in Canada. Participants were asked to rate their level of confidence (*not at all confident to always confident*) with action statements regarding breastfeeding that all began with "I can always..." A higher overall score on the scale indicated a higher level of breastfeeding self-efficacy, or confidence in the ability to breastfeed a child. This instrument had an overall reliability coefficient using Cronbach's alpha of .96 with 73% of the items having item-to-total correlations from 0.30 to 0.70. The three-factor solution addressed

the areas of confidence with I) breastfeeding technique ( $\alpha = .94$ ), II) intrapersonal thoughts ( $\alpha = .93$ ), and III) breastfeeding support ( $\alpha = .75$ ). The scale was a valid predictive instrument of breastfeeding status at six weeks postpartum.<sup>43</sup> The scale has since been translated into multiple languages and validated among various other populations of postpartum women.<sup>125,128,162</sup> Despite the high reliability of this scale to measure a level of breastfeeding self-efficacy, the instrument has only been validated for use among women who have already given birth. This instrument as a whole would be inappropriate to use to establish levels of breastfeeding self-efficacy in pregnant women due to the nature in which the scale items are worded. Most of the items ask about confidence with events and issues that would happen after birth when actually engaging in breastfeeding activity. There are promising items that address attributes and antecedents of self-efficacy theory including physiological cues, cognitive processes and affective processes that may be appropriate to include in an instrument to measure breastfeeding self-efficacy among pregnant women.

In 2003, Dennis<sup>42</sup> simplified the BSES for more streamlined use in future breastfeeding research due to feedback that items on the original instrument were statistically redundant. The Breastfeeding Self-efficacy Scale – Short Form (BSES-SF) was reduced from the original 32-item scale to an essential 14 items that could still assess levels of breastfeeding self-efficacy in postpartum women, but also identified any risk of early cessation among survey samples. The short form was validated among a Canadian sample of white women (91%) who had given birth one week prior to baseline measures. The shortened instrument had a reliability coefficient using Cronbach's alpha of .94 with item-to-total correlations from 0.64 to 0.81. The factor analysis revealed a one factor solution that encompassed the areas of breastfeeding technique, intrapersonal thoughts and support altogether. The BSES-SF was also a valid predictive



instrument of breastfeeding status at both 4 and 8 weeks postpartum. The short form has become the preferred breastfeeding self-efficacy tool used in research among postpartum populations<sup>130,163</sup> and has helped hospital personnel target the mothers in most need of assistance with breastfeeding during short post-birth hospital stays.<sup>42</sup> The individual items are worded on the BSES-SF the same as they were on the original BSES and only two remain that may be appropriate for use in an instrument to measure areas of affective processes of breastfeeding self-efficacy among pregnant women.

**Table 8.** Overview of Breastfeeding Self-efficacy Measurement Instruments

<b>Instrument</b>	<b>Theory</b>	<b>Timing</b>	<b>Purpose</b>	<b>Items and Scoring</b>	<b>Score Interpretation</b>	<b>Factors</b>	<b>Reliability</b>
Infant Feedings Intentions Scale (IFI scale) <sup>143</sup>	Theory of Planned Behavior	Pre-natal	To assess strength of prenatal intention to exclusively breastfeed	5 items; 4-point Likert-type scale ( <i>very much agree to very much disagree</i> )	Higher level of intention indicates greater level of breastfeeding self-efficacy (0-16)	No Factors Determined	$\alpha = .92$
Breastfeeding Personal Efficacy Beliefs Inventory (BPEBI) <sup>45</sup>	Social Cognitive Theory	Pre-natal	To assess levels of prenatal confidence in breastfeeding initiation and duration	24 items; visual analog scale ( <i>cannot do to certain can do</i> )	Higher score indicates greater level of breastfeeding self-efficacy (0%-100%)	I. Duration II. Technique & Social Support III. Motivation IV. Environments V. Possible Challenges	$\alpha = .89$
Prenatal Breastfeeding Self-efficacy Scale (PBSES) <sup>46</sup>	Self-efficacy Theory	Pre-natal	To assess prenatal breastfeeding self-efficacy	20 items; 5-point Likert-type scale ( <i>not at all sure to completely sure</i> )	Higher score indicates greater level of breastfeeding self-efficacy (20-100)	I. Skills and Demands II. Information III. Breastfeeding in Public IV. Social Pressure	$\alpha = .89$
Iowa Infant Feeding Attitude Scale (IIFAS) <sup>44</sup>	Multi-attribute Utility measure	Post-partum	To assess maternal attitudes towards infant feeding	17 items; 5-point Likert-type ( <i>strongly disagree to strongly agree</i> )	Higher score indicates more positive attitude towards breastfeeding	I. Favorable to breastfeeding II. Favorable to formula feeding III. Convenience	$\alpha = .86$
Breastfeeding Self-efficacy Scale (BSES) <sup>43</sup>	Self-efficacy Theory	Post-partum	To assess levels of breastfeeding self-efficacy in postpartum women	32 items; 5-point Likert-type scale ( <i>not at all confident to always confident</i> )	Higher score indicates greater level of breastfeeding self-efficacy (33-164)	I. Technique II. Intrapersonal Thoughts III. Support	$\alpha = .96$ I. $\alpha = .94$ II. $\alpha = .93$ III. $\alpha = .75$
Breastfeeding Self-efficacy Scale-Short Form (BSES-SF) <sup>42</sup>	Self-efficacy Theory	Post-partum	To assess levels of breastfeeding self-efficacy in postpartum women; to identify risk of early cessation	14 items; 5-point Likert-type scale ( <i>not at all confident to always confident</i> )	Higher score indicates greater level of breastfeeding self-efficacy (14-70)	I. Technique, Intrapersonal Thoughts, and Support	$\alpha = .94$

### *Prenatal Breastfeeding Self-efficacy Interventions*

Ten intervention studies measured breastfeeding self-efficacy in the prenatal period to assess the effects of prenatal programs designed to enhance self-efficacy and breastfeeding exclusivity and duration in the postpartum period.<sup>129,133-141</sup> Nine out of the ten studies used one of the validated instruments described previously, specifically the Breastfeeding Self-efficacy Scale, the Short Form, or the Iowa Infant Feeding Attitude Scale to measure breastfeeding self-efficacy among samples of pregnant women and to reassess self-efficacy at various time intervals after birth. One problem with this research is that these instruments were not validated to measure self-efficacy at both pre- and post-partum time frames.

Four of the ten studies outlined their interventions based on self-efficacy theory and discuss the four attributes of self-efficacy as the basis of the content and how it was provided to the intervention groups.<sup>134,136-138</sup> Despite the interventions' theoretically based designs, the methods in which prenatal breastfeeding self-efficacy was measured do not truly capture perceived self-efficacy for a behavior that cannot take place until a future time, as set forth through the attributes and antecedents of self-efficacy theory. The four studies only assessed prenatal breastfeeding self-efficacy at baseline and did not reassess before the samples of women gave birth. There were no measures to determine if any changes in breastfeeding self-efficacy occurred while the women were still pregnant.

#### **Need for Instrument**

The majority of breastfeeding self-efficacy research has focused on measuring self-efficacy at different points in the postpartum period, and the available prenatal instruments were not truly theory-based nor widely used in current literature. Most prenatal breastfeeding self-efficacy intervention studies have used instruments that have been validated in postpartum

populations to measure prenatal breastfeeding self-efficacy in order to compare to later postpartum scores.<sup>129,133-139,141</sup> A strong need exists for a self-efficacy theory-based, valid, and reliable instrument to assess prenatal breastfeeding self-efficacy and predict breastfeeding intention. A validated, theory-based instrument could be used in the future to evaluate the effectiveness of prenatal breastfeeding programs or interventions based on self-efficacy theory.

Self-efficacy theory<sup>28</sup> states that individuals tend to choose tasks they feel are within the boundaries of their abilities. Competence and ability to perform a given task may enhance the level of confidence one has in performing and managing the task. With regard to breastfeeding, the choice to engage in the activity or not may be related to level of perceived efficacy a woman has to complete the task.<sup>33</sup> A model of breastfeeding self-efficacy among pregnant mothers has not been tested or published in the literature to explain the relationship between the personal factors that may affect breastfeeding, prenatal breastfeeding self-efficacy, and intention to breastfeed. The available breastfeeding self-efficacy instruments<sup>42,43,45,46</sup> were described as valid scales that encompass the four antecedents of self-efficacy theory, but fail to follow the guidelines set forth by Bandura<sup>102</sup> for writing strong theory driven self-efficacy scales. The scales were also not constructed to properly gauge one's perceived efficacy in overcoming factors that only effect the pregnant mother in the present with regard to preparing to possibly initiate breastfeeding in the future.

An instrument that measures breastfeeding self-efficacy in a prenatal population that properly takes into account each attribute and antecedent of self-efficacy theory may help to create a functioning model of prenatal breastfeeding self-efficacy. The model could also be used to explain differences in breastfeeding intention in different populations. Future prenatal breastfeeding interventions and programs that are rooted in self-efficacy theory may be better evaluated with a more appropriate, theory-based scale.

APPENDIX B  
METHODOLOGY

This section presents descriptions of the target population and sample, information concerning sample size, a description of data collection procedures, descriptions of scales employed in this study, and a discussion of the statistical analyses for each research question.

### **Research Questions and Statistical Analysis**

The Statistical Package for the Social Sciences (SPSS) version 24.0<sup>164</sup> assessed correlations, descriptives and analysis of variance. A package of SPSS, AMOS version 17, was used for confirmatory factor analysis and structural equation modeling. An analysis of the quantitative data tested the hypotheses for each research question.

***Research Question 1: Is the instrument a valid measure of prenatal breastfeeding self-efficacy as intended by the combined constructs of performance accomplishment, vicarious experience, verbal persuasion, physiological cues, cognitive process and affective processes?***

The Prenatal Rating of Efficacy in Preparation to Breastfeed (PREP to BF) Scale is a valid ( $\alpha=.980$ ) measure of breastfeeding self-efficacy among pregnant women in the prenatal period. The hypothesis was that the instrument will measure prenatal breastfeeding self-efficacy as intended by the combination of the constructs of self-efficacy theory (performance accomplishment, vicarious experience, verbal persuasion, physiological cues, cognitive process and affective processes). Prerequisite analyses were to confirm the theoretical model through the evaluation of construct validity by conducting confirmatory factor analysis (CFA) using the maximum likelihood method. Factor loadings less than 0.30 were considered for removal and total variance accounted for was set a priori at 60%. The following model fit indices were used; Chi-square value of  $P>.05$ , Goodness-of-fit index (GFI)  $>0.90$ , Normed fit index (NFI)  $>0.90$ , and a Root mean square error of approximation (RMSEA)  $<0.80$ .

***Research Question 2: Does the instrument measure prenatal breastfeeding self-efficacy consistently across survey data collection periods?***

The Prenatal Rating of Efficacy in Preparation to Breastfeed (PREP to BF) Scale is a reliable ( $r=.920$ ) measure of breastfeeding self-efficacy among pregnant women in the prenatal period. The hypothesis was that the instrument will measure prenatal breastfeeding self-efficacy consistently during both the test and re-test data collection periods. Data for participants who took the survey both times were matched and analyzed. The researcher used Cronbach's alpha to assess internal consistency of each factor construct to determine internal reliability.

***Research Question 3: Do the combined factors of individual processes, interpersonal processes, professional advice, and social support correlate to breastfeeding intention among pregnant women?***

Breastfeeding intention and total prenatal breastfeeding self-efficacy score were also highly and significantly correlated ( $.610, p<.001$ ). The hypothesis was that the constructs of performance accomplishment, vicarious experience, verbal persuasion, physiological cues, cognitive process and affective processes combined will significantly correlate with breastfeeding intention among pregnant women. Data were tested for normality by performing a Shapiro-Wilk test that indicated the data were not normal ( $P<.001$ ). Bivariate correlations using Spearman's rank correlation for non-normal data were completed to assess the correlations between each of the factors to one another, each of the factors to the total prenatal breastfeeding self-efficacy score, and breastfeeding intention and self-efficacy score.



**Research Question 4: Are there significant differences in breastfeeding self-efficacy and its components by the personal factors of the model? (breastfeeding exposure, demographics, return to work, mode of delivery, pre-pregnancy BMI)**

This study revealed there were significantly higher PREP to BF scores among women who completed at least some college, were married, had previous breastfeeding experience, and those who planned on having a vaginal birth. The hypothesis was that there will be significant differences in prenatal breastfeeding self-efficacy and its components by each of the personal factors. Data were tested for normality by performing a Shapiro-Wilk test that indicated the data were not normal ( $P < .001$ ). Data were subjected to Mann-Whitney U and Kruskal Wallance H tests to assess differences in the mean prenatal breastfeeding self-efficacy scores and the sociodemographic factors at the significance level of  $P < .05$ . Data were subjected to Mann-Whitney U and Kruskal Wallance H tests to assess differences at the significance level of  $P < .005$  (to account for Bonferroni's correction) in scoring of the four factors of the PREP to BF scale and the sociodemographic factors. The amount of variance in the PREP to BF score explained by the significant sociodemographic factors was assessed using factorial analysis of variance (ANOVA) at the significance level of  $P < .05$ . This information will develop tailored messages for certain pregnant women based on the results of data analysis.

### **Approval**

The researcher obtained approval for study from the Institutional Review Board (IRB) at the University of Alabama prior to testing with human participants.

### **Subject Recruitment**

Participants were recruited from a convenience sample of 395 patients from the Obstetrics and Gynecology (OB/GYN) clinic at the University Medical Center on the campus of

The University of Alabama (UA). Participants needed to be older than 18 years of age to participate in the study, but could be of any race, ethnicity, or stage of pregnancy. Exclusion criteria included females who were under 18 years of age and any female with a pregnancy with multiples (e.g., twins, triples, etc.). The survey was only available in English, thus, pregnant women who did not speak English were not eligible to participate. The institutional review boards at UA and within the College of Community Health Science approved this study to be completed at the OB/GYN clinic at the University Medical Center on the campus of UA in the spring of 2017.

Data collection took place over seven weeks in March and April, 2017. Participants were recruited for the study while waiting for scheduled appointments with their physician at the OB/GYN clinic. The primary investigator approached women in the waiting area and provided the study information via a study flyer. If the woman was interested and met the study criteria, then the primary investigator obtained informed consent and the participant completed the survey. All participants who completed the survey were given \$5 cash incentive for participation. All interested participants could take a second retest reliability survey home to complete and mail back to the researcher. Participants who returned the retest survey and provided an email address were entered into a drawing to win one of ten \$25 retail gift cards.

#### *Power Analysis and Sample Size Calculation*

A pilot study included 5 participants to assess readability, comprehensibility and the time it takes to fully complete the instrument.<sup>165</sup> A power analysis calculated a required sample size for primary data collection after the number of items in the instrument is finalized. It was recommended in the literature that at least 300 participants complete the survey in order to

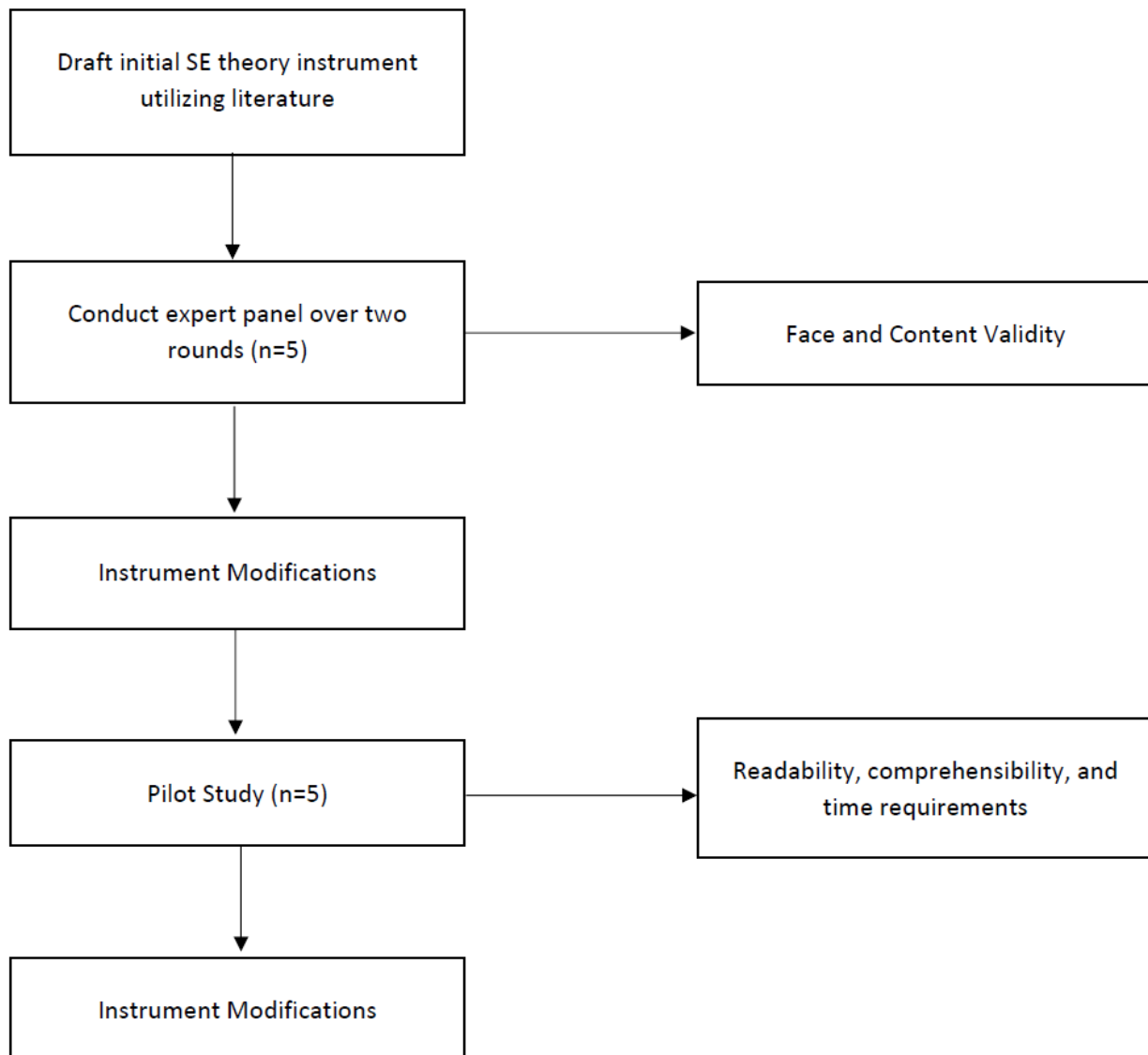
perform factor analysis.<sup>166</sup> A total of 124 participants were included in the final analysis. Minimum sample size for test-retest reliability was set at 30, which is reasonable for this purpose.<sup>167</sup> A total of 14 participants were included in the reliability analysis.

## **Study Procedures**

### *Development of Instrument*

This study proposed the development of an instrument for measuring prenatal breastfeeding self-efficacy and predicting breastfeeding intention among pregnant women. The proposed instrument consists of multiple subscales that operationalize the antecedents and attributes of self-efficacy theory.<sup>102</sup> A flow diagram on the development of the instrument can be viewed in Figure 4.

**Figure 4.** Instrument Development for Self-efficacy Theory Measures



#### *Drafting of the Instrument*

Self-efficacy theory scale items were gathered from the literature for consideration for the instrument. Newly created items adapted from previous self-efficacy scales and related to the dimensions of prenatal breastfeeding self-efficacy found in the literature were written. These items served to draft a preliminary instrument, which went to an expert panel for face and content validity, and was later evaluated with a pilot study. A minimum of four items were included for each subscale in order to determine internal consistency.<sup>168</sup> Assessment of

readability of the drafted instrument was completed in Microsoft Word. The Flesch Reading Ease score and the Flesch-Kincaid Grade Level score determined readability. The researcher modified the instrument to improve readability to a sixth-grade reading level. The researcher used several additional evaluative methods (described below) to revise the theory-based instrument to ensure accuracy of information and that pregnant mothers would understand the instrument.

### *Panel of Experts*

A panel of experts first reviewed the drafted instrument to establish content and face validity. Content validity evaluates whether the items adequately assess each construct of the theory, while face validity evaluates whether each item appears to measure what it is intended to measure.<sup>169</sup> Five experts total from the areas of breastfeeding, scale and instrument development, and health behavior theory comprised the panel.

The expert panel received evaluation forms containing all of the instrument questions with universal and operational definitions for each self-efficacy construct. For each item, the panel answered the following questions: “is the item readable,” “are the endpoints adequate,” and “is the item face valid” as “Yes or No.” At the end of each subscale of questions, they were asked to select “Yes or No” to answer the question, “do the items fit under this construct as operationally defined?” After the first round of review, appropriate revisions were made and the panel was sent the updated instrument with a second evaluation form. Changes were made to the wording of the breastfeeding intention question set to include less wording for easier reading. Panel members also felt that items asking about family members needed a note to include both the mother’s family and her partners’ family. Item wording throughout the self-efficacy scale

was adjusted as to not lead women toward a particular answer and to be very clear on the first read of the question. At the conclusion of the second round, face and content validity of the questions and constructs was affirmed by all five members of the panel.

### *Pilot Study*

Five women from the target population underwent a pilot study and completed pencil and paper questionnaires. Consent forms and protocols for the pilot study were approved by The University of Alabama Institutional Review Board before data collection. Each participant was asked to complete the instrument, of which they were timed, and circled any words they did not understand. A revision was made to the wording of one demographic question to include more precise answer choices. Completion time of the survey packet ranged from 11 to 20 minutes total. Data from the pilot surveys were not included in the statistical analyses of this study.

### *Instrumentation*

The 8-item New General Self-efficacy Scale was used in this study (see appendix A). Chen and colleagues<sup>170</sup> developed a new self-efficacy scale in 2001 with high reliability and predicted specific self-efficacy for a variety of tasks based around the original Self Efficacy Scale created by Sherer et al.<sup>171</sup> in 1982. A generalized self-efficacy scale is often included in validation studies along with a behavior-specific instrument. A general scale can assess an individuals' broad sense of confidence across a multitude of varied situations. The available scale had a moderate Cronbach's alpha score and produced a valuable independent variable that was compared to a breastfeeding self-efficacy scale score variable in an analysis.<sup>170</sup> Permission to use the scale as part of the study instrument was obtained from the author.

The 18-item Fetal Health Locus of Control Scale was used to obtain an independent measure of locus of control in this study (see appendix B). Wurtele<sup>172</sup> created the scale in 1986

to gauge pregnant mothers' beliefs in whom or what controls the health outcome of their unborn child. The scale had high reliability among the three subscales (internal, chance, and powerful others) to predict maternal related health behavior during pregnancy. Obtaining this measure provided an independent variable that was compared to breastfeeding intention and the perceived level of breastfeeding self-efficacy in the analysis. Permission to use the scale as part of the study instrument was obtained from the author.

Breastfeeding intention was measured with three questions adapted from Francis et al.<sup>173</sup> guidelines on formatting a scale to measure general intention to engage in a behavior based on the Theory of Planned Behavior (see appendix C). The questions were all worded identically asking about intention to breastfeed shortly after birth with each question beginning with either the phrase "I expect to," "I want to," or "I intend to." Adequate internal consistency has been demonstrated using the three items in this way for measuring intention for various behaviors.<sup>174</sup>

The main scale to measure prenatal breastfeeding self-efficacy (see appendix D) was constructed using newly created scale items that were based on the dimensions of breastfeeding self-efficacy found in the literature. Some scale items were adapted from items on current available instruments to measure breastfeeding self-efficacy, but were changed to reflect the suggested wording for self-efficacy scale items put forth by Bandura.<sup>102</sup> Five subscales reflecting the antecedents and attributes of self-efficacy theory were included – performance accomplishment, vicarious experience, verbal persuasion, physiological cues, cognitive processes, and affective processes. Each subscale had at least four items included in order to determine internal consistency. The main scale utilized a 10-point response scale, ranging in 1-unit intervals from 0 ("Cannot do"); through 5 ("Moderately can do"); to 10 ("Highly certain can

do”). Respondents were asked to rate how confident they were with each scale item “as of now” to reflect the present level of perceived self-efficacy for preparing to possibly engage in breastfeeding behavior in the future after giving birth.

Demographic data that was collected included (see appendix E): age, race, ethnicity, marital status, education, current employment, and WIC/SNAP/Medicaid status. Independent variables of height, pre-pregnancy weight, stage of pregnancy, parity, planned mode of delivery, previous breastfeeding experience, plan to return to work, and exposure to breastfeeding education were also collected in this section of the survey.

### *Data Analysis*

Internal consistency of the prenatal breastfeeding self-efficacy scale was assessed through Cronbach’s alpha. Confirmatory factor analysis (CFA) was performed to analyze if the scale questions fit the appropriate self-efficacy theory constructs as written. The CFA did not confirm the proposed model, therefore an exploratory factor analysis (EFA) was conducted to examine the construct validity using maximum likelihood factor analysis with varimax rotation. Cronbach’s alpha scores for the resulting factors were calculated to assess the validity of each factor. Bivariate correlations using Spearman’s rank correlation were calculated between the model factors, between prenatal breastfeeding self-efficacy score and each of the individual factors, and to assess the correlation between the overall prenatal breastfeeding self-efficacy score and breastfeeding intention. Data were subjected to Mann-Whitney U and Kruskal Wallance H tests to assess differences in the mean prenatal breastfeeding self-efficacy scores and the sociodemographic factors at the significance level of  $P < .05$ . Data were subjected to Mann-Whitney U and Kruskal Wallance H tests to assess differences at the significance level of  $P < .005$  (to account for Bonferroni’s correction) in scoring of the four factors of the PREP to BF scale

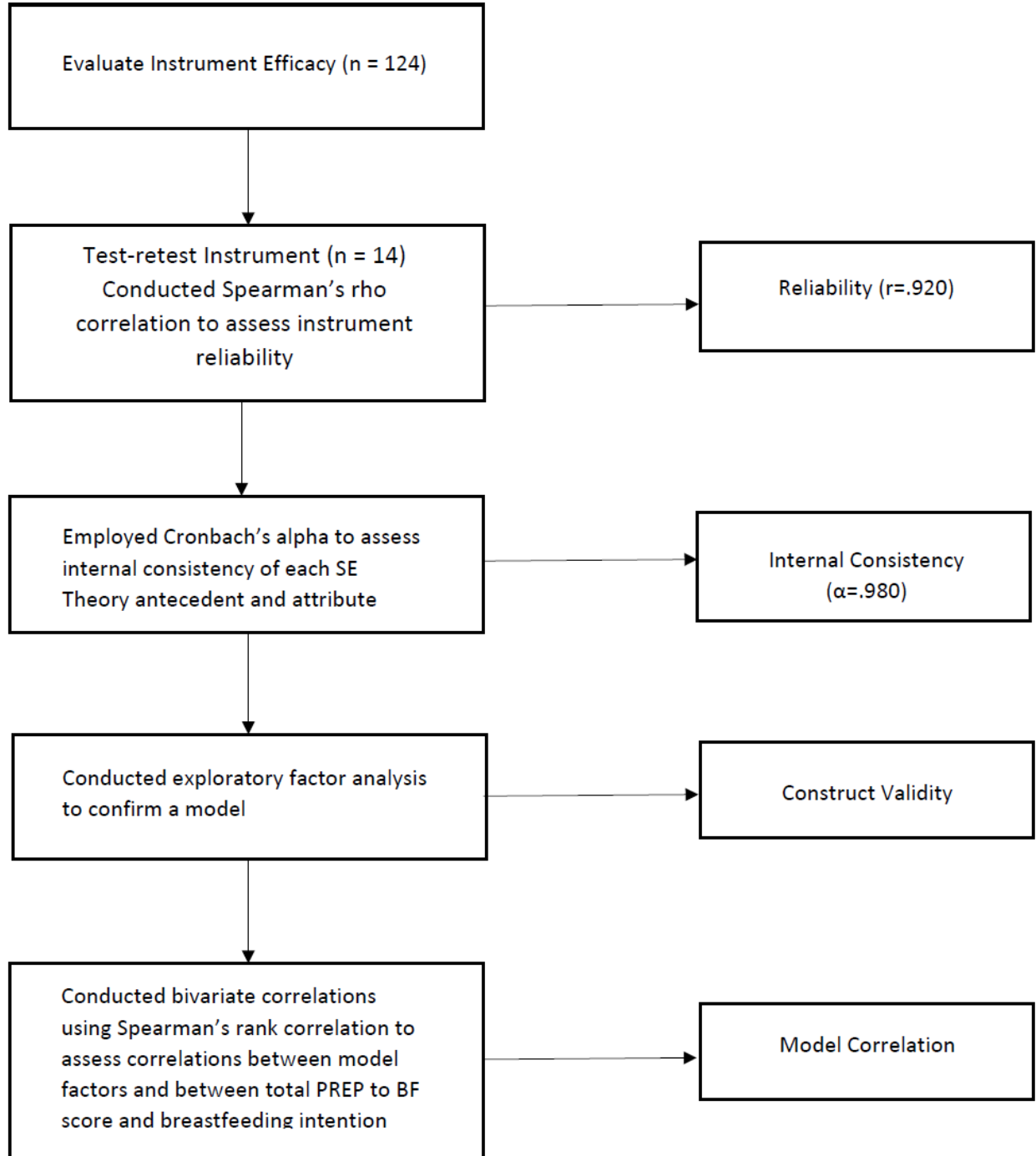


and the sociodemographic factors. The amount of variance in the PREP to BF score explained by the significant sociodemographic factors was assessed using factorial analysis of variance (ANOVA) at the significance level of  $P < .05$ . Statistical analyses were conducted using Statistical Package for the Social Sciences (SPSS) version 24.<sup>164</sup>

#### *Validation of instrument*

Established methods validated the instrument after it was developed. Concurrently, a test-retest reliability study and an efficacy study collected data by surveying pregnant women. Statistical tests set a priori to analyze collected data to assess internal reliability, construct validity, and predictive validity. See Figure 5 for a flow diagram on the validation of the instrument.

**Figure 5.** Instrument Validation of the PREP to BF Scale



The efficacy study evaluated the ability of the survey to predict breastfeeding intention among pregnant women. The sample size needed was 300,<sup>166</sup> but only 124 participants completed the survey. The efficacy study sampled the population of pregnant women who were current patients at the OB/GYN clinic at the University Medical Center on the campus of The University of Alabama. The chair of the Department of Obstetrics and Gynecology at The University of Alabama College of Community Health Sciences granted permission for data collection among the patient population of the clinic (see appendix F). The researcher collected data in the OB/GYN clinic waiting area for approximately 7 weeks. After screening interested potential participants for study qualification and completion of the informed consent process, the participant was given a paper copy of the survey to complete. The informed consent stated that participants are not obligated to take the survey and may stop taking it at any time.

After completion of the survey, each participant was given \$5 cash and, if interested, an envelope that contained a paper copy of the survey, directions for completion and return, and a numbered self-addressed stamped envelope. The directions stated for the participant to wait at least one week before completing the paper survey and mailing it back to the researcher in the provided envelope. Those participants who returned the paper survey were entered into a drawing for the chance to win one of ten \$25 Walmart electronic gift cards if they provided an email address on the paper survey and correctly answered a question. The ten winners were drawn at random using a random number generator that produced 10 random retest participant numbers. The electronic gift card codes were emailed to the winners and the researcher then deleted the email addresses thereafter.

The implementation of a test-retest reliability study established internal consistency and stability. The sample size needed to complete this study was 30,<sup>167</sup> but only 14 participants

returned the retest survey to the investigator. All paper surveys received were entered into a separate database and matched to the appropriate data from the Qualtrics survey for assessment of internal reliability of items at the completion of all data collection. After completion of data collection through the original paper copies of the survey, the researcher entered all data before cleaning and analyzing the data to answer the remaining research questions.

### *Data Management*

Once data collection was complete, any paper and pencil instrument efficacy questionnaires were entered into an Excel document. The Excel document was then converted to a SPSS file. All paper surveys received by mail were entered into a separate database for the reliability analysis. The researcher cleaned the data collected and removed any identifiable information, as well as, randomly sorted the raw data. A password-protected folder on the researcher's computer located in her office stored the data. A secure area within researcher's office held a flash drive with a copy of the data and a back-up flash drive in a separate part of the researcher's office. Statistical analyses provided an investigation of the research questions with a priori significance set at  $P < .05$ .

### *Limitations*

The proposed study was not without limitations including the use of a convenience sample of pregnant woman at one OB/GYN clinic in the southeastern United States. Although the study recruited a small sample size of women, consisting of only black and white women who spoke English, the sample represents 1/3 of the active pregnant patients of the clinic. Results from this study cannot be generalized to a larger population of ethnically diverse, pregnant women in other healthcare settings. Data collection for the study took place over 3 to 6

hours of clinic time on most days of the week, but there was not a researcher present during all clinic hours. Often the clinic required patients to complete paperwork pertaining to the current visit or to be established as a patient, which limited the amount of time some women were available to be screened by the researcher. Patients were also not approached as they were exiting clinic appointments. All of these instances may have affected the number of participants recruited for the study. Only the women who were actively pregnant during that time span and who arrived for clinic appointments while the researcher was on-site were eligible to participate in the study. All members of the target population did not have an equal chance of being recruited for this study. Future studies should ensure a researcher on site throughout all clinic hours and make an attempt to screen all patients either before or after they complete their clinic visit. Although the researcher was available to clarify any items and answer questions, potential misinterpretation of instrument items by the participants may have still occurred.

Those participants who had no intention to breastfeed may have interpreted and answered the PREP to BF scale questions differently than those who had a strong intention to breastfeed. At times some participants had a friend or family member present who was observing the participant fill out the survey in the waiting area, which may have influenced how the women were answering the PREP to BF scale questions. Sociodemographic factors of pre-pregnancy weight and height were measured by self-report and may not reflect an accurate picture of each participant's prenatal weight status.

Future studies with the PREP to BF scale should be conducted with pregnant women in more private settings of healthcare clinics with a researcher available during all clinic hours over a longer period of total study time. Approval to access patient chart data for measures such as pre-pregnancy height and weight should be obtained. The study itself being cross sectional in design lends to its own limitation of measuring the participant's confidence in the factors and total prenatal breastfeeding self-efficacy at one point in time in the pregnancy. The study is unable to draw any predictive conclusions about breastfeeding intention or breastfeeding self-efficacy.

APPENDIX C  
INSTITUTIONAL REVIEW BOARD  
STUDY APPROVAL

February 22, 2017

Erin McKinley  
Department of Health Science  
College of Human Environmental Sciences  
The University of Alabama  
Box 870311

Re: IRB # 17-OR-021-B “Measuring Confidence in Infant Feeding Decisions among Pregnant Women”

Dear Ms. McKinley:

The University of Alabama Institutional Review Board has reviewed the revision to your previously approved expedited protocol. The board has approved the change in your protocol.

Please remember that your protocol will expire on January 12, 2018.

Should you need to submit any further correspondence regarding this proposal, please include the assigned IRB application number. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants.

Good luck with your research.

Sincerely,

Stuart Usdan, PhD.  
Chair, Non- Medical Institutional Review Board  
The University of Alabama



APPENDIX D  
FULL STUDY SURVEY

*Instructions:* For questions 1 – 8, read each statement and indicate your level of agreement by circling the appropriate response. Please do not leave any questions blank.

1. I will be able to achieve most of the goals that I have set for myself.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>
2. When facing difficult tasks, I am certain that I will accomplish them.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>
3. In general, I think that I can obtain outcomes that are important to me.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>
4. I believe I can succeed at most any endeavor to which I set my mind.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>
5. I will be able to successfully overcome many challenges.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>
6. I am confident that I can perform effectively on many different tasks.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>
7. Compared to other people, I can do most tasks very well.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>
8. Even when things are tough, I can perform quite well.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>

*Instructions:* For questions 9 – 26, read each statement and select your level of certainty from 0 to 9. Zero is “strongly disagree” and 9 is “strongly agree.” Please do not leave any questions blank.

	Strongly Disagree									Strongly Agree
9. By attending prenatal classes taught by competent health professionals, I can greatly increase the odds of having a healthy, normal baby.	0	1	2	3	4	5	6	7	8	9
10. My unborn child's health can be seriously affected by my dietary intake during pregnancy.	0	1	2	3	4	5	6	7	8	9
11. If I get sick during pregnancy, consulting my doctor is the best thing I can do to protect the health of my unborn child.	0	1	2	3	4	5	6	7	8	9
12. Learning how to care for myself before I become pregnant helps my child to be born healthy.	0	1	2	3	4	5	6	7	8	9
13. What I do right up to the time that my baby is born can affect my baby's health.	0	1	2	3	4	5	6	7	8	9
14. Before becoming pregnant, I would learn what specific things I should do and not do during pregnancy in order to have a healthy, normal baby.	0	1	2	3	4	5	6	7	8	9

	Strongly Agree									Strongly Disagree
15. Even if I take excellent care of myself when I am pregnant, fate will determine whether my child will be normal or abnormal.	0	1	2	3	4	5	6	7	8	9
16. If my baby is unhealthy or abnormal, nature intended it to be that way.	0	1	2	3	4	5	6	7	8	9
17. No matter what I do when I am pregnant, the laws of nature determine whether or not my child will be normal.	0	1	2	3	4	5	6	7	8	9
18. God will determine the health of my child.	0	1	2	3	4	5	6	7	8	9
19. Fate determines the health of my unborn child.	0	1	2	3	4	5	6	7	8	9
20. Having a miscarriage means to me that my baby was not destined to live.	0	1	2	3	4	5	6	7	8	9
21. My baby will be born healthy only if do everything my doctor tells me to do during pregnancy.	0	1	2	3	4	5	6	7	8	9

	Strongly Disagree									Strongly Agree
22. The care I receive from health professionals is what is responsible for the health of my unborn baby.	0	1	2	3	4	5	6	7	8	9
23. Health professionals are responsible for the health of my unborn child.	0	1	2	3	4	5	6	7	8	9
24. Doctors and nurses are the only ones who are competent to give me advice concerning my behavior during pregnancy.	0	1	2	3	4	5	6	7	8	9
25. My baby's health is in the hands of health professionals.	0	1	2	3	4	5	6	7	8	9
26. Only qualified health professionals can tell me what I should and should not do when I am pregnant.	0	1	2	3	4	5	6	7	8	9

*Instructions:* For questions 27 – 29, read each statement and indicate your level of agreement by circling the appropriate response. Please do not leave any questions blank.

27. I expect to breastfeed this baby.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>
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28. I want to breastfeed this baby.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>
29. I intend to breastfeed this baby.	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Somewhat disagree</b>	<b>Neither agree or disagree</b>	<b>Somewhat agree</b>	<b>Agree</b>	<b>Strongly agree</b>

*Instructions:* For questions 30 – 68, read each statement and rank your level of certainty from 0 to 10. Zero is “cannot do at all” and 10 is “highly certain can do.” Please circle your responses and do not leave any questions blank.

**Thinking about your life right now, how well can you:**

	Cannot do at all	Moderately certain can do									Highly certain can do
	0	1	2	3	4	5	6	7	8	9	10
30. Gather information to help you make a decision about breastfeeding?	0	1	2	3	4	5	6	7	8	9	10
31. Obtain opportunities to watch other women breastfeed?	0	1	2	3	4	5	6	7	8	9	10
32. Ask another breastfeeding mother questions about breastfeeding?	0	1	2	3	4	5	6	7	8	9	10
33. Talk about breastfeeding with your close friends?	0	1	2	3	4	5	6	7	8	9	10
34. Talk about breastfeeding with family members? (your partner’s family and your family)	0	1	2	3	4	5	6	7	8	9	10

**Thinking about your life right now, how well can you:**

	Cannot do at all		Moderately certain can do							Highly certain can do	
	0	1	2	3	4	5	6	7	8	9	10
35. Overcome any fear you may feel about breastfeeding?	0	1	2	3	4	5	6	7	8	9	10
36. Set goals for yourself to be successful at breastfeeding your baby?	0	1	2	3	4	5	6	7	8	9	10
37. Handle friends or family that DO NOT support breastfeeding?	0	1	2	3	4	5	6	7	8	9	10
38. Find the answers to your questions about breastfeeding?	0	1	2	3	4	5	6	7	8	9	10
39. Obtain opportunities to watch other women, who look like you, breastfeed?	0	1	2	3	4	5	6	7	8	9	10
40. Accept advice about breastfeeding from family members? (your partner's family and your family)	0	1	2	3	4	5	6	7	8	9	10
41. Depend on your friends to support the decisions you make about your baby?	0	1	2	3	4	5	6	7	8	9	10
42. Mentally prepare yourself to breastfeed your baby?	0	1	2	3	4	5	6	7	8	9	10
43. Manage the possible challenges that may come with breastfeeding?	0	1	2	3	4	5	6	7	8	9	10

**Thinking about your life right now, how well can you:**

	Cannot do at all		Moderately certain can do							Highly certain can do	
	0	1	2	3	4	5	6	7	8	9	10
44. Locate breastfeeding support in your community?	0	1	2	3	4	5	6	7	8	9	10
45. Explain how to breastfeed a child to another person?	0	1	2	3	4	5	6	7	8	9	10
46. Accept advice about breastfeeding from those who are NOT friends, family, or a health care provider?	0	1	2	3	4	5	6	7	8	9	10
47. Overcome any stress you may feel about breastfeeding?	0	1	2	3	4	5	6	7	8	9	10
48. Talk about breastfeeding with those who are NOT friends, family, or a health care provider?	0	1	2	3	4	5	6	7	8	9	10
49. Accept that breastfeeding takes time?	0	1	2	3	4	5	6	7	8	9	10
50. Explain the benefits of breastfeeding to another person?	0	1	2	3	4	5	6	7	8	9	10
51. Accept others opinions (positive or negative) about breastfeeding?	0	1	2	3	4	5	6	7	8	9	10
52. Visualize yourself being successful at breastfeeding?	0	1	2	3	4	5	6	7	8	9	10



**Thinking about your life right now, how well can you:**

	Cannot do at all		Moderately certain can do							Highly certain can do	
	0	1	2	3	4	5	6	7	8	9	10
53. Commit to breastfeeding your baby?	0	1	2	3	4	5	6	7	8	9	10
54. Discuss breastfeeding with other mothers or pregnant women?	0	1	2	3	4	5	6	7	8	9	10
55. Accept that breastfeeding will NOT always be easy?	0	1	2	3	4	5	6	7	8	9	10
56. See yourself as a breastfeeding mother?	0	1	2	3	4	5	6	7	8	9	10
57. Manage your time so you can breastfeed?	0	1	2	3	4	5	6	7	8	9	10
58. Overcome any anxiety you may feel about breastfeeding?	0	1	2	3	4	5	6	7	8	9	10
59. Count on your family to support the decisions you make about your baby? (your partner's family and your family)	0	1	2	3	4	5	6	7	8	9	10
60. Accept advice about breastfeeding from close friends?	0	1	2	3	4	5	6	7	8	9	10
61. Talk about breastfeeding with your partner?	0	1	2	3	4	5	6	7	8	9	10

**Thinking about your life right now, how well can you:**

	Cannot do at all		Moderately certain can do							Highly certain can do	
62. Depend on your friends to support decisions you make about infant feeding?	0	1	2	3	4	5	6	7	8	9	10
63. Accept advice from your health care provider about breastfeeding?	0	1	2	3	4	5	6	7	8	9	10
64. Solve problems that may keep you from breastfeeding your baby?	0	1	2	3	4	5	6	7	8	9	10
65. Count on your family to support the decisions you make about infant feeding? (your partner's family and your family)	0	1	2	3	4	5	6	7	8	9	10
66. Imitate another woman breastfeeding a baby (using a doll or other prop)?	0	1	2	3	4	5	6	7	8	9	10
67. Accept advice about breastfeeding from your partner?	0	1	2	3	4	5	6	7	8	9	10
68. Talk about breastfeeding with your health care provider?	0	1	2	3	4	5	6	7	8	9	10

*Instructions:* For this last section, please write in or check off your response to each question. All responses will be kept confidential and private.

**69. What is your current age?** \_\_\_\_\_ YEARS

**70. What is your due date?** \_\_\_\_\_ MONTH \_\_\_\_\_ DAY \_\_\_\_\_ YEAR

**71. What was your weight just before you became pregnant?** \_\_\_\_\_ POUNDS

**72. How tall are you?** \_\_\_\_\_ FEET \_\_\_\_\_ INCHES

**73. Are you Hispanic or Latina? (A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.):**

- No, not Hispanic or Latina       Yes, Hispanic or Latina

**74. How would you describe yourself? (Choose one or more from the following):**

- American Indian or Alaska Native       Asian       Black or African American  
 Native Hawaiian or Other Pacific Islander       White

**75. What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.**

- |  |  |
|--|--|
| <input type="checkbox"/> No schooling completed                          | <input type="checkbox"/> Associate degree    |
| <input type="checkbox"/> 8 <sup>th</sup> grade                           | <input type="checkbox"/> Bachelor's degree   |
| <input type="checkbox"/> Some high school, no diploma                    | <input type="checkbox"/> Master's degree     |
| <input type="checkbox"/> High school graduate, diploma or the equivalent | <input type="checkbox"/> Professional degree |
| <input type="checkbox"/> Some college credit, no degree                  | <input type="checkbox"/> Doctoral degree     |
| <input type="checkbox"/> Trade/technical/vocational training             |  |

**76. Do you currently work for pay?**

- Yes, the same number of hours as before pregnancy       Yes, but with reduced hours  
 Yes, but on leave until after baby's birth       No

**77. Do you plan to work for pay during your baby's first year?**

- Yes       No

**78. How many weeks after the baby is born to you plan to return to work?** \_\_\_\_\_ WEEKS       Not Applicable

**79. In the past month, were you enrolled in the WIC program or did you get WIC food or vouchers for yourself or for any of your children?**

- Yes, just myself was enrolled
- Yes, just my child was enrolled
- Yes, myself and my child were enrolled
- No

**80. In the past month, were you enrolled in the SNAP program or get SNAP funds for yourself or for your family?**

- Yes, I was enrolled or got SNAP food for myself or my family
- No

**81. Are you covered by any kind of health insurance or any kind of health care plan, such as insurance obtained through the Marketplace, an employer, or a government program?**

- Yes, I am covered under Marketplace insurance or by my employer
- Yes, I am covered under Medicaid or another government program
- No insurance coverage

**82. What is your marital status?**

- Single, never married
- Married or domestic partnership
- Widowed
- Divorced
- Separated

**83. How do you intend to deliver your baby?**

- Vaginally
- C-section

**84. When you were a baby, were you ever breastfed?**

- Yes
- No
- Don't Know

**85. How many babies have you given birth to?**

**(If you are pregnant with your first child, write 0)** \_\_\_\_\_ BABIES

**86. How many of your babies did you breastfeed (for any time at all)?**

**(If you are pregnant with your first child, write 0)** \_\_\_\_\_ BABIES

**87. Have you been told by your doctor that you have any of the following conditions during this pregnancy? (check all that apply)**

- High or low blood sugar
- Low placenta in the uterus
- High blood pressure
- Combination of high blood pressure *and* protein in your urine

**88. While pregnant with this baby or with any other baby, did you receive or seek out any information about breastfeeding your baby from any of the following sources? (Check all that apply)**

- Doctor
- Nurse or Midwife
- Doctor's Office Staff
- Prenatal class or Lamaze class
- Lactation Counselor
- Registered Dietitian
- Breastfeeding class or support group
- Online webinar or email newsletter
- Social media (i.e. Facebook, Twitter, Instagram, etc.)
- Print magazine (i.e. Parents, Working Mother, Parenting, etc.)
- Breastfeeding/Pregnancy website (usbreastfeeding.org, breastfeedingbasics.com, etc.)
- Health information website (womenshealth.gov, webmed.com, cdc.gov, etc.)
- No information received
- Did not personally seek out any information

**THIS IS THE END OF THE SURVEY.**

**PLEASE FILL OUT THE RECEIPT FORM AND RETURN THE PACKET TO THE RESEARCHER.**

APPENDIX E

THE PRENATAL RATING OF EFFICACY IN PREPARATION  
TO BREASTFEED (PREP to BF) SCALE

## The Prenatal Rating of Efficacy in Preparation to Breastfeed (PREP to BF) Scale

*Instructions:* For the following questions, read each statement and rank your level of certainty from 0 to 10. Zero is “cannot do at all” and 10 is “highly certain can do.” Please circle your responses and do not leave any questions blank.

### Thinking about your life right now, how well can you:

#### Individual Processes

Overcome any fear you may feel about breastfeeding?

**0      1      2      3      4      5      6      7      8      9      10**

Overcome any anxiety you may feel about breastfeeding?

**0      1      2      3      4      5      6      7      8      9      10**

Set goals for yourself to be successful at breastfeeding your baby?

**0      1      2      3      4      5      6      7      8      9      10**

Mentally prepare yourself to breastfeed your baby?

**0      1      2      3      4      5      6      7      8      9      10**

Manage the possible challenges that may come with breastfeeding?

**0      1      2      3      4      5      6      7      8      9      10**

Overcome any stress you may feel about breastfeeding?

**0      1      2      3      4      5      6      7      8      9      10**

Accept that breastfeeding takes time?

**0      1      2      3      4      5      6      7      8      9      10**

Accept others opinions (positive or negative) about breastfeeding?

**0      1      2      3      4      5      6      7      8      9      10**

Visualize yourself being successful at breastfeeding?

**0      1      2      3      4      5      6      7      8      9      10**

Commit to breastfeeding your baby?

**0 1 2 3 4 5 6 7 8 9 10**

Accept that breastfeeding will NOT always be easy?

**0 1 2 3 4 5 6 7 8 9 10**

See yourself as a breastfeeding mother?

**0 1 2 3 4 5 6 7 8 9 10**

Manage your time so you can breastfeed?

**0 1 2 3 4 5 6 7 8 9 10**

Solve problems that may keep you from breastfeeding your baby?

**0 1 2 3 4 5 6 7 8 9 10**

### **Interpersonal Processes**

Ask another breastfeeding mother questions about breastfeeding?

**0 1 2 3 4 5 6 7 8 9 10**

Obtain opportunities to watch other women breastfeed?

**0 1 2 3 4 5 6 7 8 9 10**

Talk about breastfeeding with your close friends?

**0 1 2 3 4 5 6 7 8 9 10**

Talk about breastfeeding with family members? (your partner's family and your family)

**0 1 2 3 4 5 6 7 8 9 10**

Obtain opportunities to watch other women, who look like you, breastfeed?

**0 1 2 3 4 5 6 7 8 9 10**



Accept advice about breastfeeding from family members? (your partner's family and your family)

**0 1 2 3 4 5 6 7 8 9 10**

Locate breastfeeding support in your community?

**0 1 2 3 4 5 6 7 8 9 10**

Explain how to breastfeed a child to another person?

**0 1 2 3 4 5 6 7 8 9 10**

Accept advice about breastfeeding from those who are NOT friends, family, or a health care provider?

**0 1 2 3 4 5 6 7 8 9 10**

Talk about breastfeeding with those who are NOT friends, family, or a health care provider?

**0 1 2 3 4 5 6 7 8 9 10**

Explain the benefits of breastfeeding to another person?

**0 1 2 3 4 5 6 7 8 9 10**

Discuss breastfeeding with other mothers or pregnant women?

**0 1 2 3 4 5 6 7 8 9 10**

Accept advice about breastfeeding from close friends?

**0 1 2 3 4 5 6 7 8 9 10**

Talk about breastfeeding with your partner?

**0 1 2 3 4 5 6 7 8 9 10**

Imitate another woman breastfeeding a baby (using a doll or other prop)?

**0 1 2 3 4 5 6 7 8 9 10**

Accept advice about breastfeeding from your partner?

**0 1 2 3 4 5 6 7 8 9 10**

**Professional Advice**

Gather information to help you make a decision about breastfeeding?

**0 1 2 3 4 5 6 7 8 9 10**

Find the answers to your questions about breastfeeding?

**0 1 2 3 4 5 6 7 8 9 10**

Accept advice from your health care provider about breastfeeding?

**0 1 2 3 4 5 6 7 8 9 10**

Talk about breastfeeding with your health care provider?

**0 1 2 3 4 5 6 7 8 9 10**

**Social Support**

Handle friends or family that DO NOT support breastfeeding?

**0 1 2 3 4 5 6 7 8 9 10**

Depend on your friends to support the decisions you make about your baby?

**0 1 2 3 4 5 6 7 8 9 10**

Count on your family to support the decisions you make about your baby? (your partner's family and your family)

**0 1 2 3 4 5 6 7 8 9 10**

Count on your family to support the decisions you make about infant feeding? (your partner's family and your family)

**0 1 2 3 4 5 6 7 8 9 10**

Depend on your friends to support decisions you make about infant feeding?

**0 1 2 3 4 5 6 7 8 9 10**