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**Review of Instruments to Measure Breastfeeding Beliefs and Intent Among
Nulliparous Black College Women**

By Jaime L. Eunice

A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Nursing
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Abstract

United States breastfeeding rates are below Healthy People 2020 national goals, with African American women at the lowest rates. According to the theory of planned behavior, intention is a strong determinant of actual behavior. The purpose of this review is to uncover how researchers can best measure attributes that influence the intention to breast feed in the African American college aged population of nulliparous women. Tools to measure breastfeeding knowledge, attitudes, beliefs, cultural and social norms will be identified. Searches of health databases and Google Scholar located peer-reviewed journals using keywords such as Black, African American, instrument, female and student. The literature was searched and this review found that there are no published sources that specifically study the Black female college student population. However, numerous tools that have been used in research with other modern, Western university students groups may also be used with this population. Factors determined to be important to intention included exposure, knowledge, individual attitudes toward breastfeeding, with a focus on psychosocial embarrassment and social norms. The findings support researchers by suggesting future interventions, and development of tools that can be used to measure effectiveness.

Keywords: breastfeeding, African American, female, undergraduate students, tools, measurements, culture, literature review

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Dad, you were right. I am where I'm supposed to be...

“But whoever lives by the truth comes into the light, that it may be seen plainly that what he has done has been done through God.” John 3:21

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Introduction

Mothers who breastfeed are more likely to be White, older, married, and have support from the infant's father, family friends, and health professionals (Lewallen and Street, 2010). The Centers for Disease Control (2010) reported that of children born in 2003-2006, non-Hispanic Blacks had a lower prevalence of initiating breastfeeding than non-Hispanic Whites or Hispanics in all but two U.S. states. In fact, out of thirty-three states sampled, only in one did African Americans meet the Healthy People 2010 breastfeeding initiation goal of 75%. And the United States Department of Health and Human Services (HHS, 2010) Healthy People 2020 goals continue to rise, with the next goal at 81.9%.

Lewallen and Street (2010) stated that more research is needed to understand the effect of culture on breastfeeding disparities that exist amongst African Americans and European Americans. They found that African American women struggle with breastfeeding issues such as time and work schedules, conflicting information, as well as cultural reasons that are unique to their population. For instance, African American women who breast fed felt a lack of support from African Americans, who viewed breastfeeding as something that only European Americans do. According to the Mortality and Morbidity Weekly Report (MMWR) of the Centers for Disease Control and Prevention (CDC, 2005), non-Hispanic African Americans have a disproportionate rate of disease when compared to other races. Targeting African Americans with interventions that will prevent disease, such as improving breastfeeding rates may improve health and quality of life for this group overall.

Studies focusing on nulliparous women are important since studies such as O'Campo, Faden, Gielen, and Wang (1992) have identified that the prenatal period is an opportune time to

initiate interventions to promote education about the benefits of breastfeeding and promote its duration. There are no other examples of studying specifically female African American college students with relation to breastfeeding, but there have been U.S. studies involving college students and breastfeeding (Marrone, Vogeltanz-Holm, Holm, 2008, O'Keefe, Henly, Anderson, 1998). However, a potential intervention by Maureen McGinty of Jacksonville University (personal communication, January 12, 2011) will sample a group of nulliparous, African American sorority members at Jacksonville University for factors and intentions related to breastfeeding. According to Chambers, McInnes, Hoddinott, & Alder (2007), there is a need for instruments that measure factors related to breastfeeding decisions so that interventions such as McGinty's are supported.

Purpose

To test the effectiveness of educational interventions, measuring instruments to evaluate previous and resulting knowledge and intentions are necessary. The aim of this study is to discover how researchers can best measure breastfeeding knowledge, attitudes, beliefs, and intentions among young, nulliparous, African American women who are also college students and to identify tools that are available.

Background

Breastfeeding Benefits

Breastmilk benefits an infant in many ways, including immunological protection and improved developmental outcomes. The Policy Statement made by the American Academy of Pediatrics (AAP, 2005) identifies evidence that breastfeeding lessens the incidence of otitis media, necrotizing enterocolitis, urinary tract infection, bacterial meningitis, diarrhea, and respiratory tract infection in infants. In addition, infants who are breastfeeding may also have decreased rates of asthma, diabetes mellitus type one and type two, hypercholesterolemia, lymphoma, leukemia, and obesity in children and adults that are breastfed. It is suggested that breastfeeding may enhance the performance of cognitive abilities (AAP, 2005). Conversely, the United States Department of Health and Human Services (HHS) found that infants who are never breastfed have a 56% higher risk of Sudden Infant Death Syndrome than those that are breastfed (2011). Evidence demonstrates that human milk is the best, most specific nutritive substance for human infants, and is the most digestible form (HHS, 2011).

Breastfeeding also benefits mothers in the form of physical and psychosocial health. For instance, mothers who breastfeed their infants return more quickly to pre-pregnancy weight, and have decreased risk of breast and ovarian cancer, and decreased hip fractures and osteoporosis postmenopause (AAP, 2005). After birth, the uterus of a woman who breastfeeds returns to its prepregnancy size more quickly and the bleeding that may occur with birth lessens (Barber & Cusack, 2006). Breastfeeding may also lower rates of post partum depression and may extend the time before menstrual cycles and additional children can be born (Huggins, 2010). Another

important benefit to the mother is financial. Breastfeeding is free, whereas formula feeding can cost from \$1,200 to \$4,000 in the first year of life.

Breastfeeding benefits extend to the community also. Mothers who breastfed and work contribute more to the workforce because they take less time off to care for a sick baby (Barber & Cusack, 2006). There are less healthcare costs because the children need fewer doctor visits and have less chronic illness that continue throughout their life (HHS, 2011). Breastfeeding also has less environmental impact than bottle feeding, because it does not require packaging, transportation, and disposal of materials.

Breastfeeding in African Americans

Studies about factors that led to choosing breast or bottle feeding within the African American community were not always specific to that community. A study by Lee, Rubio, Elo, McCollum, Chung, & Culhane (2005) grouped all minorities together, while others such as Grossman, Larsen-Alexander, Fitzsimmons and Cordero (1998) examined breastfeeding decisions among all women of low socioeconomic status. Researchers believed that there may have been cultural issues affecting breastfeeding rates among Black women and began studying Black American breastfeeding exclusively, with a focus on cultural factors. Researchers used focus groups to identify factors such as a lack of support within their own community and conflicting information amongst health professionals to their community (Lewallen & Street, 2010). Another study by McCarter-Spaulding and Gore (2009) claims to be the first to study breastfeeding self-efficacy in Black women, using the Breastfeeding Self Efficacy-Short Form, and demonstrates that self-efficacy is a better indicator of exclusive breastfeeding duration than a mother's plan to breastfeed. This study also analyzes the participants by their different ethnic

groups living in America, such as African, African-American, Caribbean, and others, realizing that this could also affect breastfeeding rates.

A few others began testing interventions, such as the Gross et al (1998) study which improved breastfeeding duration in African-American Women Infants and Children (WIC) program participants who received counseling and watched motivational videos. Since young age is associated with lower breastfeeding rates, some studies target young adult and adolescent Black females, such as a Sayegh, Erickson, Fortenberry, Castrucci (2007) case study that examined the effects of a WIC outreach. In general, these studies target an antenatal or postpartum sample of women, rarely the nulliparous.

Theoretical Framework

According to the Theory of Planned Behavior (Ajzen, 1991) an individual's intention to perform a particular behavior is a strong predictor of the actual performance of that behavior. Intentions are the result of the individual's perceived control (knowledge, self-efficacy), attitude (beliefs) and subjective norms (cultural factors). Knowledge and self-efficacy or the belief that an individual can accomplish a task (Bandura, 1994) are integral components of perceived control. Attitudes and beliefs are similar constructs and subjective norms include the surrounding environment of family, community and important others. Understanding factors that determine African American women's intention to breast or formula feed is important to developing appropriate and effective interventions to improve breastfeeding prevalence in this population.

Method

The Theory of Planned Behavior (Ajzen, 1991), was used to organize the structure of the review and as a framework to search nursing and medical literature for tools that measured beliefs, attitudes, knowledge and cultural factors that influenced breastfeeding intention. The databases used to locate literature included CINAHL, Academic One File, MEDLINE at EBSCOhost, and Google Scholar. Key words searches included African American, Black, breast-feeding, lactation, infant feeding, self-efficacy, knowledge, beliefs, habits, intent*, decision, culture, nullipar*, young, university student, college student, undergraduate, female, scale, tool, assessment, instrument, and score. Due to the limited results, no studies were excluded based on date of publication.

These searches yielded over 345 possible articles. After reviewing the titles and abstracts, 57 were retained. Of these, after reading the complete article, only 22 were relevant to this review. The reference lists of included articles were also reviewed to identify additional potential studies and one additional study was identified by this method. The final number of articles included in this study was 23. Although the initial intention was to identify tools and factors related to African American college age women, the scarcity of studies using tools or measuring these factors in this population caused the search to be expanded to include studies from other countries, other ethnic groups and those that included high school students with college age adults.

Findings

Tools Used with College Students

Perceived Control/Knowledge

Kang, Song, and Im (2005) used a modified questionnaire based on World Health Organization's "Ten Steps for Successful Breastfeeding" which measured knowledge of breastfeeding promotion behaviors. Dodgson and Tarrant (2007) also used the Ten Steps but to create a tool that measured the intention of Hong Kong nursing students to promote breastfeeding among future clients.

An important part of breastfeeding knowledge was exposure to breastfeeding. This was often included in the "demographics" section of the questionnaires. Tarrant and Dodgson (2007) measured male and female Hong Kong university students' exposure by asking three questions, about whether the participant had been breastfed, knew anyone who had breastfed, or had ever witnessed a woman breastfeeding. A "yes" answer scored a one and a "no" answer scored zero. An "unsure" response was scored the same as a "no" response, and their exposure was categorized from 0-1 as low and 2-3 as high. When combined with a 14-item dichotomous knowledge survey about fundamentals of infant feeding based on another study by Pollock, Bustamante-Forest, and Giarratano (2002), consulted experts rated the knowledge questionnaire a content validity index of 0.93.

Marrone, Vogeltanz-Holm, and Holm (2008) tested students' knowledge of breastfeeding through the use of the Infant Feeding Knowledge Test-Form A. This was used by Grossman, Harter, and Hasbrouck (1990) in prenatal intervention studies with women as a pre-test post-test with control group design. The Infant Feeding Knowledge Test—Form A tests

knowledge of breastfeeding with multiple choice and true-false questions. Marrone, Vogeltanz-Holm and Holm (2008) found a Crohnbach alpha score of 0.54, but do not state which type of reliability this measures.

Kang, Song, and Im (2005) modified their Breastfeeding Knowledge Questionnaire based on a questionnaire given to pediatric medical students in Williams and Hammer's 1995 study. It included 56 questions about anatomy and physiology of lactation, breastfeeding benefits and contraindications, breastfeeding management of milk expression and sore nipples, and infant assessment. This study was one of the few that mentioned a pilot test of the instruments used, which yielded an adequate Crohnbach's alpha of 0.86.

Some studies did not describe what scale was used for the knowledge questionnaire, nor the source of its content. Bukhari, Najmi, Adeeb, Shareef, Zahid, and Khan (2003) used a questionnaire with open and closed ended questions at a girl's college in Karachi, Pakistan. The study discussed some of the results for questions based on sources of breastfeeding knowledge, for which mothers and then media were the highest. Other question topics included the need of infant vitamin and mineral supplementation and benefits such as the prevention of diarrhea. Tjiang and Binns (2001) assessment was comprised of 53 close-ended question which were gathered from related literature.

Attitudes/Beliefs

Kang, Song, and Im (2005) state the use of a modified attitude questionnaire from a doctoral thesis Jeong's 1997 doctoral thesis. The resulting Breastfeeding Attitude Questionnaire had 20 Likert- type questions measuring perceptions, emotions, and practical aspects of

breastfeeding. It was modified to use a three-point Likert scale and in pilot testing had an adequate Crohnbach alpha of 0.79.

Tarrant and Dodgson (2007) used a previously used Likert scale to measure attitudes, and modified its original form into a four-point scale. The four-point scale eliminated neutral responses, which had been prevalent in the Hong Kong university student responses in other studies. The Infant Nutrition Attitude Questionnaire had been developed by Pollock, Bustamante-Forest, and Giarratano (2002), who had used it with southern U.S. fathers of diverse cultural backgrounds. Tarrant and Dodgson (2007) modified the questionnaire for use with Hong Kong university students, rather than U.S. fathers. They changed the term “bottle-feeding” to “infant formula feeding” to prevent confusion because breast milk can be expressed and provided in a bottle. The internal reliability was reported as 0.70 in this study.

The Iowa Infant Feeding Attitude Scale (IIFAS: De La Mora, Russell, Dungy, Losch, and Dusdieker, 1999) was used in several studies (Johnston-Robledo, Wares, Fricker, and Pasek, 2007; Marrone, Vogeltanz-Holm, Holm, 2008). It contains 17 questions in a five-point Likert scale and measures beliefs about issues such as convenience, comparisons to formula feeding, and breastfeeding management. Higher scores were more predictive of breastfeeding intention and duration (Marrone, Vogeltanz-Holm, Holm, 2008). Internal consistency was measured as high with Crohnbach’s alpha at .86 in the De La Mora et al study(1999), but proved to have a lower score, 0.72, when used by Johnston-Robledo, Wares, Fricker, and Pasek (2007).

Johnston-Robledo, Wares, Fricker, and Pasek (2007) assessed interpersonal predictors of breastfeeding, and developed Likert-type scales about the belief of the indecency of public breastfeeding, attractiveness of breast size, and students’ future concerns about breastfeeding.

They also used some feminist scholarship scales such as the Objectified Body Consciousness Scale (OBCS) and the Self-objectification Questionnaire (SOQ; Noll and Fredrickson, 1998).

Forbes, Adams-Curtis, Hamm, and White (2003) measured how erotophobia and sexism might influence perceptions of breastfeeding women among male and female university students. Most of the scales used were developed in previous psychosocial studies and adapted some for use topics pertaining to breastfeeding. They used a complicated system of surveys and data analysis, but unified the results by making each tool a 6-point Likert scale, which also eliminated neutral responses. First researchers assessed the participants' views towards sex by using the Hostile Sexism and Benevolent Sexism Scales from the Ambivalent Sexism Inventory, Hostility Toward Women Scale, Trait Guilt and Moral Standards Scales, and Sexual Opinion Survey. Then they compared the participant's perceptions of women who breastfeed to women who bottlefeed using the Perceived Quality of Motherhood Scale, Personal Attributes Questionnaire, Big Five personality factors, Social Desirability Index, Global Positive Impression Scale, and Global Negative Impression Scale. The Perceived Quality of Motherhood Scale (Friedman, Weinberg, & Pines, 1998) is a tool that was used to rate the perceptions of Jewish men and women, aged 20-60, about motherhood and sexuality.

Dodgson and Tarrant (2007) used similar scales to measure beliefs that had been used by Duckett et al, (1998) and O'Keefe et al (1998), whose researchers derived their scale from the Minnesota Infant Feeding Questionnaire (Lewallen, 2006). The Minnesota Infant Feeding Questionnaire measured subjective norm, intention, and duration elements, which relate to the Theory of Planned Behavior. Dodgson and Tarrant (2007) reported internal reliability scores from 0.80 to 0.92.

African American health practices and beliefs also have an impact on breastfeeding. Sharps, El-Mohandes, El-Khorazaty, Kiely, and Walker (2003) used a Maternal Health Beliefs Questionnaire and discovered that low income African American women who perceive breastfeeding to be beneficial to their baby's and their own health are more likely to initiate breastfeeding. Other studies found that mothers who were more health conscious, such as abstaining from tobacco use, had higher rates of breastfeeding (Forste, Weiss, & Lippincott, 2011; Lee, Rubio, Elo, McCollum, Chung, & Culhane, 2005).

Cultural Factors

None of the searches identified measurement tools specifically addressing subjective norms or cultural factors. However some studies included qualitative components that explored this component of intention.

African Americans experience similar factors as women of other races, in addition to those that pertain only to their culture. Simply being Black may predetermine a mother for a different breastfeeding experience. Forste, Weiss, and Lippincott (2001) analyzed data collected from the 1995 National Survey of Family Growth and found that working outside the home correlated negatively with breastfeeding among African Americans. The results of surveys conducted by O'Keefe, Henly, and Anderson (1998) demonstrated that structural barriers to breastfeeding, such as lack of specified breastfeeding locations on campus, would deter all of women from breastfeeding. However, employment and structural barriers were common to women of diverse races. A descriptive analysis from the 1988 National Maternal and Infant Health Survey by Beal, Kuhlthau, and Perrin (2003) showed that Black women were more likely to get bottle feeding advice simply because they were Black and not White. No other factors,

such as socioeconomic status, correlated as greatly as race when it came to receiving formula feeding advice from physicians and WIC counselors. Gross et al (1998) affirmed that intention and hospital practices can determine breastfeeding initiation among African Americans in a two-by-two factorial design study.

An important theme seen in modern western societies and specifically among African American women has to do with embarrassment. Some studies tried to explain this phenomenon, and suggested self-objectification, and the corporeality of female breastfeeding (Johnston-Robledo, Wares, Flick, and Pasek, 2007). Adolescent African American girls expressed disgust toward the act of breastfeeding in a qualitative study by Hannon, Willis, Bishop-Townsend, Martinez, and Scrimshaw (2000). When the concept of embarrassment was studied in American college students, it showed that trait guilt or morality had no effect on breastfeeding views, but that discomfort with sexual feelings, stimuli, and experiences correlated with less favorable opinions about breastfeeding (Forbes, Adams-Curtis, Hamm, & White (2003)). An interesting double bind occurred in studies related to embarrassment (Forrester, Wheelock, & Warren, 1997). Students responded that they would be embarrassed to breastfeed in front of friends or in public, but more than two-thirds of participants would not be embarrassed if someone breastfed in their presence. Many students believed that some places were unacceptable to breastfeed, such as at a shopping mall, in a stranger's home, or at church. More acceptable places were in friends and relatives homes. This may be summed up by saying that most students believed that breastfeeding locations should be personal, not public (O'Keefe, Henly and Anderson, 1998). However, these studies did not specify the race of the participants.

O'Keefe, Henly and Anderson (1998) concluded that educating students about breastfeeding was not as important as changing the norms of social situations. Exposure to breastfeeding seems to be a factor in deciding to breastfeed, with less exposure leading to less breastfeeding among African American adolescents (Hannon, Willis, Bishop-Townsend, Martinez, & Scrimshaw, 2000). According to Forrester, Wheelock, and Warren (1997), students have positive attitudes about breastfeeding, such as its healthful nature, but most felt that the act was embarrassing, although not obscene. They also postulated that school education or added exposure through television may increase comfort and knowledge, thereby developing more positive attitudes towards breastfeeding while students are young.

Students also considered breastfeeding inconvenient when compared with bottle feeding. Hong Kong students realized that formula feeding allowed more freedom for the mother (Tarrant & Dodgson, 2007). The African American community has similar impressions, and Black adolescents negatively viewed breastfeeding for this reason until some learned about expressing breast milk by pump (Hannon, Willis, Bishop-Townsend, Martinez, & Scrimshaw, 2000). Adults and adolescents alike fear that breastfeeding will be painful (Bently, Dee, & Jensen, 2003; Sayegh, Fortenberry, Castrucci, 2007).

Other studies have also shown that Black culture and experience has factors that might need to be considered when assessing attitudes and intention to breastfeed (Lewallen & Street, 2010). In a descriptive study Underwood, Pridham, Brown, and Limbo (1997) discovered that Black beliefs about infant feeding may differ from what is recommended by the American Academy of Pediatrics (AAP, 2005). For instance, the lower income Black women of the study thought that breastfeeding was the best choice, but most bottle-fed. They believed that

reconstituted formula should be thicker in concentration, so that it looked more like breast milk, even if that meant adding additional powder to the liquid. The women believed that solid foods should be introduced early, at two months of age, instead of at four to six months. And they believed that giving infants additional water was essential. The researchers discovered that the stated beliefs, assumptions, experiences and shared practices determined their feeding habits. A study by Hannon, Willis, Bishop-Townsend, Martinez, and Scrimshaw (2000) showed that some Black female adolescents believed that certain foods, such as chocolate, green beans, orange juice, and corn, should not be eaten while breastfeeding and some believed that formula was “normal” milk.

Studies such as Lewallen and Street (2010) show that African Americans are influenced by their closest social relationships. Other researchers showed that the most important influences come from the mother’s mother and grandmother (Sayegh, Erickson, Fortenberry, & Castrucci; 2007, Bentley, Dee, & Jensen, 2003) and the father of the infant (Bentley, Dee, & Jensen, 2003). Women who continued to live with the father of the child tended to have higher rates of breastfeeding (Lee, Rubio, Elo, McCollum, Chung, & Colhane 2005). Outside sources consider the importance of peer counseling during breastfeeding (Gross et al 1998; Oyeku, 2010) and advice given by healthcare workers.

In their qualitative study, Lewallen and Street (2010) give examples of women who chose to base their behavior on the opinions and advice of significant others. However, at the lowest-income and highest risk mothers, maternal self-determination superceded these perceptions (Sharps, El-Mohandes, El-Khorazaty, Kiely, & walker, 2003). Among Black adolescent mothers the “strength of influence varied among the adolescents and by itself was not predictive of the

decision to breastfeed” (Hannon, Willis, Bishop-Townsend, Martinez, & Scrimshaw, 2000, p. 404). They chose instead to breastfeed despite teacher, mother, baby’s father, friends, relatives, and healthcare workers’ decisions. One study pointed out that inner city White women were less likely to breastfeed than inner city Black women (Lee, Rubio, Elo, McCollum, Chung & Colhane, 2005). This finding refutes the accepted convention that Black women are less likely to breastfeed than White women, suggesting instead that social economic status and culture are not independent of each other in the decision to breastfeed.

Bentley, Dee, and Jensen (2003) proposed examining breastfeeding from a social ecological framework, which also addresses culture. They examined different sphere that impact breastfeeding behaviors. For instance, the environment may deter breastfeeding because of fear for personal safety in crime afflicted areas and when using public transportation. They also realized that the wider sphere of public legislation had an impact upon breastfeeding. Black mothers on welfare were forced to work, which negatively impacted breastfeeding. Conversely, breastfeeding is now a legal right, a fact that some Black women are unknowlegeable about.

Intention

The students’ breastfeeding intention was often asked in a single question, without any additional instrument. For instance, Tarrant and Dodgson (2007) asked whether the participant wanted to breastfeed their children or have his or her partner to breastfeed their children. Johnston-Robledo, Wares, Fricker, and Pasek (2007) asked several questions about considering infant feeding, plans for infant feeding, planned duration, and planned supplementation. Dodgson and Tarrant (2007) used the WHO’s Ten Steps to Successful Breastfeeding to create a

tool that measured the intention of Hong Kong nursing students to promote breastfeeding among future clients.

Discussion

Studying Breastfeeding in Undergraduate Students

There were no studies identified in this review that measured attitudes, knowledge, beliefs or intent of only African American female students. At the end of this review, there was only evidence that one Black male and one Black female were included in the ten studies of college students located in this review.

A disparate group of tools and coding methods have been used to measure breastfeeding factors among students. Consequently, the tools cannot be generalized to different groups, nor can data results be compared in a meta-analysis. Chambers, McInnes, Hoddinott, and Alder claimed, “Various formal scales or tools to measure psychosocial variables have been developed over the past two decades, however, their usefulness and appropriateness has yet to be fully identified” (2007, p.17). Out of the many tools and factors, the only instruments or research listed as being validated among several populations is WHO’s Ten Steps to Breastfeeding Success (Dodgson & Tarrant, 2007; Kang, Song, & Im, 2005), the Iowa Infant Feeding Attitude Scale (Johnson-Robledo, Wares, Fricker, & Pasek, 2007; Marrone, Vogeltanz-Holm, & Holm, 2008), and the Minnesota Infant Feeding Scale (Dodgson & Tarrant, 2007; O’Keefe, Henly, & Anderson, 1998). Researchers often generate questionnaires like Jiang and Binns (2001, p. 6) “from the related literature” then modify items, or design their own tools. After creating these tools, the reliability and validity are not stated in the studies. Future researchers should be cautious in their use of tools, and should conduct prior analysis.

Theory of Planned Behavior

Many studies based their assessments on the Theory of Planned Behavior by Ajzen (1991). Chambers, McInnes, Hoddinott, and Alder (2007) recognized that few studies tested anything other than psychosocial variables such as knowledge, attitudes, beliefs, and experiences related to breastfeeding. This review found that they were incorporated in the tools of five studies with undergraduate students (Dodgson & Tarrant, 2007; Kang, Song, & Im, 2005; Tarrant & Dodgson, 2007; Marrone, Vogeltanz-Holm, & Holm, 2008; O'Keefe, Henly, & Anderson, 1998). Dodgson and Tarrant (2007) modified its use in the Duckett et al (1998) study, and also used the theory with Hong Kong students. Additional frameworks of breastfeeding research have introduced feminist research (Johnston-Robledo, Wares, Fricker, and Pasek, 2007) and the social ecological framework (Bentley, Dee, & Jensen, 2003). However, only the social ecological framework addresses culture, and there are no instruments used to assess for cultural factors and breastfeeding.

Attitudes about breastfeeding were studied heavily by researchers for the undergraduate population. Perhaps because this is more indicative of breastfeeding behavior than any other factor and because nulliparous women are not expected to have much knowledge of breastfeeding (Tarrant & Dodgson, 2007). Also, cultural beliefs are not quite being recognized and analyzed as prominent determinants of breastfeeding behaviors (Lewallen and Street, 2010).

There is a need for a common measure of exposure for college students, since it heavily affects knowledge and attitude. Marrone, Vogeltanz-Holm, and Holm (2008) operationalized exposure as a Likert score of how often the student has seen different types of infant feeding,

while Tarrant and Dodgson (2007) ask three questions about exposure to self, acquaintance, and stranger breastfeeding. Other exposure might include media sources.

Another tool that should be developed for student use is an intentions tool. Some only measured intention with the closed question, “do you intend to breastfeed?” (Dodgson and Tarrant, 2007). Marronne, Vogeltanz-Holm, and Holm (2008) asked students to rate the probability of choosing to breastfeed an infant with increments, 0%, 1-20%, 21-40%, 41-60%, 61-80%, and 80-100%. In the future, perhaps researchers could use the Infant Feeding Intentions Scale (Nommsen-Rivers & Dewey, 2008), which was developed after many of these studies were conducted. This scale proved to be valid when used in a low-income, multi-ethnic U.S. primipara group of mothers. An area for future research is to follow undergraduate peer groups and test intention scales ability predicting behaviors among college students.

Another area to assess is subjective norms, such as significant others, and even how they feel culture and media views breastfeeding. This seems important because researchers have identified embarrassment as a barrier to breastfeeding (Dodgson & Tarrant, 2007; Forrester, Wheelock & Warren, 1997; Johnston-Robledo, Wares, Fricker, & Pasek, 2007; Tarrant & Dodgson, 2007), and the opinions of referent others can be influential to African American breastfeeding. A study by Hill, Arnett, and Mauk (2008), assessed subjective norms for Black and Hispanic pregnant and lactating women by developing a scale that measured the participant’s perception of how specific family and friends felt about breastfeeding. They also asked women what they thought society thinks about breastfeeding. Coupled with intentions, data in this area could improve knowledge about how norms correlate with decisions to breastfeed, and even point toward social interventions.

Other Considerations

There is a gap in the type of available studies. Most studies assess breastfeeding attitudes and habits among low-income Black women. However, Black college women are usually from more affluent backgrounds, and are more likely to be affluent upon graduation. There is a need for studies of college educated Black women to determine factors that influence Blacks to breastfeed for all socioeconomic classes, not just low-income urban groups. Researchers will have to expand their usual sample populations from urban WIC locations to women at suburban birthing centers.

Sexual orientation was not listed under demographics of any of these studies. However, Johnston-Robledo, Wares, Fricker, and Pasek (2007) made an acknowledgement that “participants were not asked to report their sexual orientation” in their study. Tarrant and Dodgson (2007) did not make reference to sexual orientation, but when asked about feeding intentions of male and female university students, the question was stated, “wants self or partner to breastfeed” and could be taken as a non-discriminatory question. This could be a new area of study, or something to keep in representation during creation of instruments.

Limitations of the Study

The review was limited to mostly medical and nursing journals about breastfeeding research. Because of this, it is possible that some sociological information about culture’s effect on breastfeeding was left out. Also excluded were books on African American breastfeeding, journal articles for which access could not be reached without fees or membership, and doctoral dissertations. These may have yielded cutting edge research.

Studies about this topic span at least two decades of research, and the amount of content became overwhelming. As a result, the analysis could be expanded. Also, there are many breastfeeding instruments that were used in older populations that could also be considered for use with African American female college students. However, this study focused on those used with the younger college aged student.

Conclusion

This review found that many different tools, some modified from previous ones, can be used to assess breastfeeding determinants for nulliparous African American college women. Most assessed fundamental breastfeeding knowledge, some using questionnaires based on recommendations by medical professionals and health organizations. Most studies considered exposure an important factor, measuring it as being breastfed, breastfeeding, or observing others. There were many tools used to assess attitudes and beliefs about breastfeeding, women who breastfeed, and comparisons to formula feeding. Researchers identified embarrassment as a barrier to breastfeeding and began assessing its cause, using tools to assess students' beliefs about indecency, locations of acceptable public breastfeeding, and self-objectification. Because of the modifications of existing tools, and creation of new tools used in very specific populations, there are barriers to creating meta-analysis.

Researchers have not studied these determinants among young female African American undergraduates exclusively. There may be additional cultural norms, such as healthcare worker advice to Black women and different beliefs about breastfeeding, that may affect breastfeeding decisions in this population. There needs to be additional studies with high income African American women, African American college students, and incorporation of cultural factors into the instruments themselves.

Any conclusions drawn by this study may be useful in understanding the needs of future instrument development. It should also be useful to researchers who are selecting instruments for studies similar to McGinty's research, in which an intervention is evaluated, or for studying

nulliparous African American females' breastfeeding attitudes, knowledge, beliefs, and intention throughout the country.

**APPENDIX A: TABLE 1. TOOLS USED WITH COLLEGE STUDENTS TO
MEASURE FACTORS RELATED TO BREASTFEEDING**

Table 1. Tools used with college students to measure factors related to breastfeeding

Author	Ethnic Group/ Number of subjects	Tool	Attributes Being Measured		
			Perceived Control Knowledge/Self- efficacy	Attitude/ Beliefs	Intention
Bukhari, Najmi, Adeeb, Shareef, Zahid, & Khan (2003)	250 female college students in Karachi, Pakistan	General questionnaire	Measures knowledge, source of knowledge, facts and fallacies related to breastfeeding, and social class and level of education of participants' parents		
Dodgson & Tarrant (2007)	Hong Kong nursing students/ N=111	Breastfeeding promotional behaviors; 19 true/false questions	Breastfeeding practices based upon WHO's Ten Steps for Successful Breastfeeding		

Dodgson & Tarrant (2007)	Hong Kong nursing students/ N=111	Breastfeeding and formula feeding beliefs; 19 item Likert scale		Beliefs about outcomes of breast-feeding and formula feeding	
Dodgson & Tarrant (2007)	Hong Kong nursing students/ N=111	Breastfeeding and formula feeding attitudes; 6 items each on 7-point semantic differentiated scale		Attitudes towards breastfeeding and bottle feeding (e.g., unhealthy-healthy, unnatural—natural)	
Forbes, Adams-Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Hostile Sexism and Benevolent Sexism Scales from the Ambivalent Sexism Inventory		Assesses participant's personal hostile-sexist or benevolent-sexist type inclinations; 6-point Likert scale	
Forbes, Adams-Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Hostility Toward Women Scale		Assesses participants' hostile attitudes toward women; 6-point Likert scale	

Forbes, Adams- Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Trait Guilt and Moral Standards Scales		Assesses the participants' stable personality determinant of state guilt 6-point Likert scale	
Forbes, Adams- Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Sexual Opinion Survey, short form		Measure of participants' erotophobia or erotophilia; 5-items 6- point Likert scale	
Forbes, Adams- Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Experiences with breastfeeding	Series of questions		

Forbes, Adams-Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Perceived Quality of Motherhood Scale		16-item, 6-point Likert scale, with factor analytically derived scale including Invested Mother, Egalitarian Mother, and Rejecting Mother, and single statement item about being a good mother; Comparison of breastfeeding and bottlefeeding women	
Forbes, Adams-Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Personal Attributes Questionnaire		16-item version, 6-point Likert scale, measures perceived instrumental and expressive traits, includes perceived gender identity of "masculine" and "feminine"; used for comparison of breastfeeding and bottlefeeding women	

Forbes, Adams- Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Big Five personality factors		24 adjectives to compare perceptions of the personalities of women who breast or bottle-feed	
Forbes, Adams- Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Social Desirability index		13 items—compared breastfeeding and bottle- feeding mothers; measure contains a “neutral point” of desirability/undesirability	
Forbes, Adams- Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Global Positive Impression Scale		Based on the mean of responses to 19 adjective phrases that to compare described selected social behaviors of women who breast or bottle-feed	

Forbes, Adams- Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Feelings Scale		11 polar adjective pairs were used to described how participants felt when thinking about a woman breastfeeding her baby	
Forbes, Adams- Curtis, Hamm, & White (2003)	103 female and 93 male midwestern US undergraduate students, 4 are married, 85% are European American	Attitude Toward Breastfeeding Scale		9-items	
Forrester, Wheelock, & Warren (1997)	343 highschool and 244 college students in US	20 close-ended, check all that apply, and multiple choice questions and one question about age	Sources of breastfeeding information; exposure to breastfeeding	Belief about potential impact of breastfeeding education; attitudes toward breastfeeding factors such as nutrition and convenience; Acceptability of various locations for a woman to breastfeed; perceived embarrassment associated with breastfeeding	Intent of breastfeeding own children

Johnston-Robledo, Wares, Fricker, & Pasek (2007)	275 nulliparous female undergraduates from northeastern US campus, 93% European American, 7% other ethnicities	Measure of infant feeding plans			3 questions assessing participants' ever considering a feeding plan, how they might feed a baby, and specific plans for duration/ formula supplementation
Johnston-Robledo, Wares, Fricker, & Pasek (2007)	275 nulliparous female undergraduates from northeastern US campus, from psychology department subject pool	Public breastfeeding as indecent		8- item, 7-point Likert scale rating breastfeeding in public, such as obscenity of pictures of breastfeeding and embarrassment if a friend breastfed in participants' presence	

Johnston-Robledo, Wares, Fricker, & Pasek (2007)	275 nulliparous female undergraduates from northeastern US campus, from psychology department subject pool	Participant's belief that larger breast size after breastfeeding is more attractive		One item, 7-point Likert scale	
Johnston-Robledo, Wares, Fricker, & Pasek (2007)	275 nulliparous female undergraduates from northeastern US campus, from psychology department subject pool	Iowa Infant Feeding Attitude Scale		17 item 5-point Likert scale to assess attitude toward breast and formula feeding	
Johnston-Robledo, Wares, Fricker, & Pasek (2007)	275 nulliparous female undergraduates from northeastern US campus, from psychology department subject pool	Future concerns about breast feeding:		10 item 7-point Likert scale measuring beliefs about shame, impact on body shape and sexuality, and degree of concern	

Johnston-Robledo, Wares, Fricker, & Pasek (2007)	275 nulliparous female undergraduates from northeastern US campus, from psychology department subject pool	Objectified Body Consciousness Scale (OBCS), three subscales		Measures Surveillance, Body Shame, and Appearance Control Beliefs; 8 items and 5-point Likert scale per subscale	
Johnston-Robledo, Wares, Fricker, & Pasek (2007)	275 nulliparous female undergraduates from northeastern US campus, from psychology department subject pool	Self-objectification Questionnaire (SOQ)		Participants rank 12 attributes according to importance to physical self-concept, compares appearance-based and competence-based physical attributes	
Kang, Song, & Im (2005)	136 male and 205 female unmarried Korean undergraduates	Breastfeeding Knowledge Questionnaire 56 items, with 9 subcategories;	Understanding of breastfeeding from exposure, includes anatomy and physiology, benefits, barriers, management of special situations, etc.		

Kang, Song, & Im (2005)	136 male and 205 female unmarried Korean undergraduates	Breastfeeding Attitude Questionnaire; 20 items, 3-point Likert scale modified from 5-point (Jeong, 1997)		Measures conditions of readiness to certain behavior (like, dislike), belief of usefulness and benefits of breast or formula feeding; focus on perceptual, emotional, and practical attitudes	
Marrone, Vogeltanz-Holm, & Holm (2008)	110 female and 50 males US undergraduate students	Infant Feeding Knowledge Test-Form A	10 multiple choice and 10 true-false questions about knowledge of breastfeeding		
Marrone, Vogeltanz-Holm, & Holm (2008)	110 female and 50 males US undergraduate students	Iowa Infant Feeding Attitude Scale (IIFAS)		17 statements based on 5-point Likert scale; measures attitudes toward aspects of infant feeding, including nutrition, expense, convenience, sexuality, and infant bonding	

Marrone, Vogeltanz-Holm, & Holm (2008)	110 female and 50 males US undergraduate students	Breastfeeding Behavior Questionnaire (BBQ)		Participants rate breastfeeding scenarios on a 6-point Likert scale; scenarios include breastfeeding in front of people in home or public places, and influence of others on decisions	
Marrone, Vogeltanz-Holm, & Holm (2008)	110 female and 50 males US undergraduate students	Sociodemographic measures	Breastfeeding exposure such as participants' breastfeeding history and duration, and 4-point Likert scale of how often participants observed a particular infant feeding method		Assesses probability of participants breastfeeding future children on 6-point Likert scale
O'Keefe, Henly, & Anderson, (1998)	58 US university students and 49 US college faculty, staff, and administrators	Beliefs about outcomes of breast feeding and bottle feeding (for 6 months or more)		Outcomes involve infant health and development, practical concerns, and the relationship of mother and infant	

O'Keefe, Henly, & Anderson, (1998)	58 US university students and 49 US college faculty, staff, and administrators	Attitudes toward breast feeding and bottle feeding		24 items, six sets of adjective pairs in 7-point semantic differential format; includes pleasant-unpleasant, convenient-inconvenient	
O'Keefe, Henly, & Anderson, (1998)	58 US university students and 49 US college faculty, staff, and administrators	Appropriateness of breastfeeding settings		Participants indicate observation of breastfeeding in certain locations (home, car, school, church, restroom, etc) and rate the suitability of each location as natural, neutral, or appropriate for breastfeeding.	
O'Keefe, Henly, & Anderson, (1998)	58 US university students and 49 US college faculty, staff, and administrators		Breastfeeding exposure	The sum of a participant's experiences with breastfeeding, including observation and participation	

Tarrant & Dodgson (2007)	403 Hong Kong male and female university students, nulliparous, some married	One scale, multiple sections	Knowledge questionnaire, 14-item dichotomous scale; Fundamental knowledge of infant feeding, not technical aspects of lactation	Infant feeding attitudes, 15 item, 4- point Likert scale (eliminate neutral response)	Single question; that assessed whether participant wanted self or partner to breastfeed future children
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