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FACTORS IDENTIFIED BY NUTRITIONISTS AS AFFECTING BREASTFEEDING RATES AMONG PARTICIPANTS OF THE SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS AND CHILDREN

Lauren Casey

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ABSTRACT

FACTORS IDENTIFIED BY NUTRITIONISTS AS AFFECTING BREASTFEEDING RATES AMONG PARTICIPANTS OF THE SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS AND CHILDREN

by
Lauren E. Casey

Objective: The purpose of this study was to assess the attitudes of WIC Nutritionists regarding current WIC breastfeeding programs as well as their suggestions for potential interventions to promote breastfeeding within WIC. Methods: WIC Nutritionists from three counties in Georgia were emailed a link to a brief survey regarding their demographics, breastfeeding promotion at their clinics, and perceived barriers and interventions for discussing breastfeeding in their clinics. Data was analyzed using descriptive statistics. Results: Twenty-seven WIC Nutritionists from Gwinnett, Newton, and Rockdale counties and the District Office completed the survey. All of the respondents indicated that they believed breastfeeding is important and that their clinics are providing breast pumps and peer support groups for mothers who have chosen to breastfeed. The vast majority (92.6%) indicated that they are very likely to discuss breastfeeding with pregnant mothers during their initial session. Lack of interest was reported by 37% to be the primary barrier to discussing breastfeeding with mothers, and the most popular intervention reported was educational programs for family members of the mother (26%). Conclusion: WIC Nutritionists in Gwinnett, Newton, and Rockdale counties have positive attitudes toward breastfeeding and provide support for mothers seeking it in the form of education and resources early in pregnancy. Each clinic should
have the opportunity to determine the key barriers to breastfeeding in their clinic population and find evidence-based interventions that will best serve their clients.
FACTORS IDENTIFIED BY NUTRITIONISTS AS AFFECTING BREASTFEEDING RATES AMONG PARTICIPANTS OF THE SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS AND CHILDREN

By

Lauren E. Casey

A Thesis

Presented in Partial Fulfillment of Requirements for the Degree of

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Department of Nutrition

Georgia State University

Atlanta, Georgia
2017
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FACTORS IDENTIFIED BY NUTRITIONISTS AS AFFECTING BREASTFEEDING RATES AMONG PARTICIPANTS OF THE SUPPLEMENTAL NUTRITION PROGRAM FOR WOMEN, INFANTS AND CHILDREN

INTRODUCTION

Breastfeeding is one of the most powerful tools at the disposal of healthcare providers and parents to lower the risk of infant mortality.\(^1\) It is an unequalled, ideal food that promotes healthy infant development and growth, as well as an important component of maternal health.\(^2\) The United States Department of Agriculture (USDA) Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides nutrition counseling for pregnant, breastfeeding and postpartum mothers, infants, and children up to five years of age.\(^3\) In order to qualify for WIC, the income of the family must be at or below 185% of the federal poverty guidelines.\(^3\) WIC serves nearly half of the infants in the United States, which accounts for roughly 2 million babies per month.\(^4\) Therefore, the information and nutrition education provided through WIC has a profound effect on health and nutrition at a vital time in a child’s life.\(^5\) The nutritionists that work at WIC can plan an important part of their clients’ decisions regarding whether or not to breastfeed.

As an agency, the WIC program acknowledges the importance and superiority of breastfeeding as a form of infant nutrition.\(^6\) However, despite the efforts that have been made to include programs for the support of breastfeeding mothers and changes to the food packages available, in 2005, 0.6% of the WIC budget excluding rebates was spent on the promotion of breastfeeding.\(^7\) It should be noted, however, that WIC has made
many changes since the data for this statistic was collected, and this as well as many other studies seek to evaluate WIC’s ongoing progress toward breastfeeding promotion.

WIC purchases more than half of the infant formula sold in the country and receives rebates from formula companies that account for up to a third of the operating budget of the program. Mothers who participate in WIC have the lowest rates of initiation and duration of breastfeeding, and the changes in food packages that were intended to increase breastfeeding rates have not significantly increased the percentage of WIC mothers that breastfeed. The AAP also formerly recommended that 100% fruit juice not be introduced until an infant is 6 months of age or older, which is consistent with WIC guidelines. However, the newly updated AAP recommendations state that it is not optimal to provide juice before a year of life. While WIC does reduce the financial strain of families in need, it could simultaneously incentivize behaviors such as early weaning by providing formula. This is less than desirable and can result in the children of those families having greater risk for obesity and other nutrition related disorders later in life.

WIC Nutritionists interact with pregnant WIC participants prior to delivery. Therefore, they have a unique perspective on the participants’ attitudes towards breastfeeding and intentions to breastfeed as well as potential barriers to breastfeeding. Previous studies have reported that the attitudes of healthcare providers toward breastfeeding can affect the rates of initiation and duration of breastfeeding. Additionally, even the perception of neutrality on the part of healthcare providers can have a negative effect. Research has also shown that WIC does have an influence over
what is eaten by the children it serves. At this time, the attitudes of WIC Nutritionists towards the existing WIC breastfeeding promotion programs and suggestions for improvement are unknown. The purpose of this study was to assess the attitudes of WIC Nutritionists in three counties in Georgia, Gwinnett, Newton, and Rockdale, regarding current WIC breastfeeding programs as well as their suggestions for potential interventions to promote breastfeeding within WIC.

Table 1. 2015 Race and Hispanic Origin in Gwinnett, Newton, and Rockdale Counties

<table>
<thead>
<tr>
<th>Race</th>
<th>Gwinnett</th>
<th>Newton</th>
<th>Rockdale</th>
</tr>
</thead>
<tbody>
<tr>
<td>White, Non-Hispanic</td>
<td>39.6%</td>
<td>49%</td>
<td>35.3%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>27.6%</td>
<td>43.7%</td>
<td>52.2%</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
<td>0.8%</td>
<td>0.4%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Asian</td>
<td>11.8%</td>
<td>1.1%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>2.6%</td>
<td>1.9%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>20.5%</td>
<td>5.3%</td>
<td>10%</td>
</tr>
</tbody>
</table>

The demographic characteristics of the population served by the WIC Nutritionists that participated in this study are shown in Table 1. The information from this study may assist WIC administrators with implementation of additional breastfeeding promotion mechanisms within the WIC system. The primary aim of the study is to describe WIC Nutritionists’ reported attitudes toward breastfeeding, barriers to discussing...
the importance of breastfeeding to pregnant mothers, and suggestions for potential interventions to increase breastfeeding rates among WIC mothers. We anticipated that the vast majority of WIC Nutritionists will report that breastfeeding is vitally important to the health, growth, and development of the infant, that they are very likely to discuss the benefits of breastfeeding with pregnant women at their initial WIC session, that time is the primary barrier to promoting breastfeeding with pregnant women, and that the recommended intervention will be more time with pregnant women at their initial visit to discuss the benefits of breastfeeding. A secondary aim of this study is to examine the differences in WIC Nutritionist attitudes and recommendations by clinic location. We expected that the responses by the WIC Nutritionists would be consistent regardless of the clinic location.
LITERATURE REVIEW

Breastmilk Composition and Rates of Breastfeeding

Human breastmilk is the ideal source of nutrition for infants. It includes bioactive molecules, stem cells, immune cells, nutrients and oligosaccharides as well as an adequate proportion of fat (55%), protein (7%), and carbohydrate (38%) to promote healthy infant growth and development.\textsuperscript{17} In most countries, women in lower income families breastfeed far longer than their higher-income counterparts.\textsuperscript{18} However, in the United States, there are various reasons why mothers are subliminally or directly discouraged from taking advantage of the benefits that breastfeeding provides.\textsuperscript{19–21} In 2011, only 18.8% of infants born in the United States were exclusively breastfed at 6 months, which is the recommendation by the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), and the American Congress of Obstetricians and Gynecologists.\textsuperscript{2,22} However, this number was dependent on education of the mother, age of the mother, family support, and family income.\textsuperscript{22} Essentially, older mothers with higher education, more family support, and a higher income are more likely to begin breastfeeding and to breastfeed longer.

The benefits of breastfeeding have been documented for decades, and the research that has accumulated regarding the benefits of breastfeeding is extensive and growing, particularly in the areas of epigenetics and stem cells.\textsuperscript{18} Among the benefits for infants are decreased infectious mortality and morbidity, higher intelligence, and lower risk of dental malocclusions.\textsuperscript{18} There is also literature indicating that infants who are breastfed have “lower rates of diarrhea, otitis media, lower respiratory tract infections, Type 1 and
Type 2 diabetes, childhood leukemia, necrotizing enterocolitis, and Sudden Infant Death Syndrome.” The benefits for the mother include lower risk of breast cancer, potential reduction of diabetes and ovarian cancer risk, and improved birth spacing, among others.

Economic research shows that in the United States, 90% compliance with breastfeeding recommendations for the first six months would result in $13 billion per year savings and the prevention of over 900 deaths, almost all of whom would be infants. However, mothers who breastfeed can face personal economic hardship not only during the months of infancy, but into the future. There are many reasons why this could be the case, though none of them have been determined definitively. It may be because of the time commitment that breastfeeding requires in conjunction with the continued lack of environments supportive to breastfeeding. Another possibility is that breastfeeding changes a woman’s attitude toward family and working, making family more attractive and working less attractive. Another explanation is that there is a cultural or social mandate that mothers be the primary caregivers of children and that they should put the needs of their children before their own. Regardless of the reasons why, breastfeeding is not truly cost free for mothers in the short and long term.

Social and Economic Determinants of Breastfeeding

There are several socioeconomic factors that affect a mother’s decision to breastfeed. In many countries there is a negative stigma associated with women breastfeeding in public. There is also a problem with access to maternity leave. Mothers with maternity leave less than six weeks are far less likely to breastfeed and
those that do breastfeed have a shorter duration.\textsuperscript{25} In addition, mothers who choose to breastfeed for six months or longer have higher income losses long term than mothers who choose not to breastfeed or breastfeed for a shorter period of time.\textsuperscript{24} Based on these data, the question may be raised if workplace design in the United States may not promote long-term breast feeding practices. In a context that is supportive, the intention to breastfeed is a strong determinant of initiation and duration.\textsuperscript{25} For this reason, it is vital that a supportive environment is provided for mothers who have the desire to breastfeed, but many workplaces and public spaces are not supportive to these mothers.

In 2011, Jensen used data from the 2007 National Immunization Survey in order to assess to run four analyses of breastfeeding rates and their relationship to WIC participation. The independent variables identified for this study were mother’s race/ethnicity, mother’s education, mother’s age group, mother’s marital status, child ever received WIC benefits, income to poverty ratio, and WIC status. According to this study, mothers with race and ethnicity marked “other” had the highest rate of breastfeeding initiation (80%), and Hispanic women had the longest duration of breastfeeding among those initiated (8.3 months). Mothers who were college graduates had the highest initiation and duration (86%, 8.6 months). Rates of both initiation and duration are positively associated with education, so women with less than twelve years of education had the lowest rates of initiation (65%) and with more years of education come higher rates of initiation. Similarly, both initiation and duration are positively associated with maternal age. Mothers who are married are more likely to breastfeed than those who have been married (widowed, divorced, separated, or have a deceased spouse) at 81% and 66%, respectively. Those who have been married are more likely to
breastfeed than those who were never married (60%). Mothers whose child has never received WIC benefits had higher rates of initiation and duration than those whose child had ever received WIC benefits (84% and 67%, respectively). Those who are WIC eligible have lower rates of initiation and duration than those who are not WIC eligible (82% and 69%, respectively). However, when this group is further stratified, mothers who are WIC eligible but do not receive WIC services have higher rates of breastfeeding initiation than mothers who receive WIC services, and this group has the longest duration of all groups, including those ineligible for WIC services at 79% initiation and 9.3 months duration. Mothers aged thirty years and older had the highest rates of initiation and duration (80% and 8.4 months) and mothers aged nineteen and younger had the lowest (55% and 5.3 months). Jones et al. (2011) also found this association between breastfeeding and maternal age.19

In 2014, Darfour-Oduro and Kim had similar findings when they recruited mothers from local WIC clinics in eastern Illinois.22 Their significant findings included that married mothers were over three times more likely to initiate breastfeeding and over four times more likely to be breastfeeding at three months of life. They also found that mothers who receive food stamps are less likely to initiate breastfeeding. It has also been shown that short maternity leave leads to a significant reduction in breastfeeding initiation and duration.25

In a multivariate analysis of breastfeeding rates in the United States, Kogan et al. (2008) used data from the National Survey of Children’s Health from January 2003 to July 2004 from all fifty states.16 They used the data set to determine the odds of not initiating breastfeeding. They found that increased income was positively associated with
breastfeeding, and negatively associated with the presence of a smoker in the household with an OR of 1.57. Like Darfour-Oduro and Kim, they found that the mother’s marital status was a strong indicator of breastfeeding initiation. Single mothers were less likely to initiate breastfeeding than married mothers (OR 1.47). Two-parent step families were less likely to initiate breastfeeding than single mothers (OR 1.78), and those who marked “other” for family structure were the least likely of all to initiate, indeed less than half as likely as the married mothers (OR 7.74). Interestingly, nativity status was another predictor of breastfeeding initiation. If the child was born outside of the United States or if the child was born in the United States but one or both of the parents were born outside of the United States, breastfeeding initiation was far more likely than if both parents and the child were born in the United States (OR 0.71 and 0.47 respectively). What may be surprising is that maternal health status and maternal mental health status were not associated with any change in breastfeeding initiation.

Some of the determinants of breastfeeding cannot be readily changed, such as poverty level, race, family structure, and nativity status of the parents. Statistically, in the United States, white mothers are more likely to breastfeed than minority mothers, with the exception of those who have moved to the United States from other countries, who have a higher rate. Mothers with lower incomes and less family support have lower breastfeeding rates. Interventions to support breastfeeding can be targeted at improving determinants that can be changed, such as maternal smoking, smoking in the household, or the mental and emotional health of the mother. Additionally, programs should focus on informing mothers of the importance of breastfeeding.
WIC and Breastfeeding

WIC serves nearly half of all infants born in the United States. The mission of WIC is “to safeguard the health of low-income women, infants, and children up to age 5 who are at nutrition risk by providing nutritious foods to supplement diets, information on healthy eating, and referrals to health care.” While not explicitly stated, breastfeeding would be an important component to safeguarding the health of this population. Currently, WIC claims to promote breastfeeding in the following five ways:

1. WIC mothers choosing to breastfeed are provided information through counseling and breastfeeding educational materials.
2. Breastfeeding mothers receive follow-up support through peer counselors.
3. Breastfeeding mothers are eligible to participate in WIC longer than non-breastfeeding mothers.
4. Mothers who exclusively breastfeed their infants receive an enhanced food package.
5. Breastfeeding mothers can receive breast pumps, breast shells or nursing supplementers to help support the initiation and continuation of breastfeeding.

Despite these efforts, mothers who received WIC services throughout the United States were far less likely to initiate breastfeeding. Two-thirds (67%) of these mothers initiated breastfeeding, as opposed to the 79% of WIC-eligible non-participants and 84% of non-eligible non-participants. In addition, WIC participants had an average breastfeeding duration of 6.7 months, compared to 9.3 months in WIC-eligible non-participants and 8.2 months in non-eligible non-participants. In the counties surveyed in
the current study, breastfeeding initiation was 61.22% and the percent of breastfeeding infants that were breastfed for at least 6 months was 47.75%, which is below the national average, but above the rest of the state of Georgia. Although breastfeeding rates have risen in recent years, the percentage point of WIC mothers choosing to breastfeed has remained consistent, even following the implementation of an updated food package aimed at increasing the incentive to breastfeed. While the disparity in breastfeeding rates has historically been associated with income, it seems that there is also a disparity that is more pronounced between WIC and WIC-eligible non-participants at the same income level.

Although there is a negative correlation between income and breastfeeding rates in the United States, the opposite is observed throughout the rest of the world. However, when the breastfeeding statistics are subdivided into WIC-eligible participants and WIC-eligible non-participants, it is possible to look at the problem from a new perspective. The most striking fact is that WIC-eligible non-participants had the longest duration of breastfeeding, perhaps because they were not as eager to wean their children due to financial incentives. So while WIC removes some of the financial strain its participants are under, it simultaneously incentivizes behaviors such as decreased initiation and duration of breastfeeding, which can have a negative impact on the health of those participants and their children by making less desirable choices readily available.

The Infant Formula Industry

When discussing the importance of breastfeeding and the need for breastfeeding support it is important to include information about infant formula and the growth of the
infant formula industry. In the 1970s following an increase in breastfeeding in the United States and accompanying fall in formula consumption, Nestlé capitalized on the perception of their product as Westernized, implying to Third World mothers that formula was a better way to feed their infants. However, after initiating use of the product instead of initiating breastfeeding at this critical time, poverty necessitated the mothers dilute it, sometimes as much as three times the proper amount.22

Due to controversy and following an expose on these practices, the WHO and the United Nations Children’s Fund (UNICEF) responded with an International Code on the Marketing of Breastmilk Substitutes in 1981. It has been reaffirmed periodically, and most recently in 2002 when these international organizations reported that rates of breastfeeding are still falling far short of recommendations, with fewer than 35% of infants around the world exclusively breastfed for even the first four months of life, let alone the first six months2.

As of 2015, in the United States infant formula was a $3 billion industry, and is a $302 billion industry worldwide.25,30 Marketing to mothers began early, with a 1915 Nestlé advertisement that told mothers to “look out for that first little tooth,” which was formerly a developmental step that mothers who cannot breastfeed would never see. 30 At the time of this advertisement, breastfeeding initiation rates were 70%, and this dwindled to only 25% between 1946-1950.31 Regaining a national understanding of the importance and benefits of breastfeeding has been an uphill battle, with some women going as far as to lay the blame for the gender pay gap at the feet of those who support breastfeeding.24 Despite this, breastfeeding rates have been rising, but there is still a strong connection between WIC and the formula companies.
WIC and Infant Formula

WIC purchases over half of the infant formula sold in the United States. Most states offer formula manufacturers the exchange of a per-can rebate for each unit of formula sold for an exclusive marketing right to the WIC participants of that state. The rebate system works in a somewhat convoluted fashion. Mothers who choose the formula option receive vouchers that they can use to purchase a specific type and brand of infant formula. The cost is paid by WIC. This cost has two components: the first is the wholesale price which goes to the manufacturer, and the markup which goes to the retailer. Both of these prices have been rising in recent years, as has the number of WIC participants. The increase in price of infant formula can be largely attributed to supplements such as docosahexaenoic acid (DHA) and arachidonic acid (ARA) that have been added to infant formula and which are more expensive to manufacture, and higher retail markups. In 2013, bids for formula ranged from $0.07-$4.14 per 26 fluid ounces with larger states receiving lower bids, and bids were placed from three companies: Mead Johnson, Abbot, and Nestlé/Gerber. These three companies’ products accounted for 98% of dollar sales of infant formula in the United States.

In these rebate programs, the cost to WIC can be determined by the following equation: Cost to WIC = (retail price – wholesale price) + (wholesale price – rebate). The rebate in these situations are generally determined by the wholesale prices of the product when the bid is placed, and in recent years have been over 90% of the wholesale price. Rebates to WIC clinics totaled $1.9 billion in the 2013 fiscal year, which is substantial for an industry that is worth ~$3 billion dollars. In addition, the total amount
given to WIC in grants in 2016 was $6.6 billion, and the WIC budget does not expand based on their need. These rebates allow for between a quarter and a third of the operating budget, depending on the state. This is a clear conflict of interest at the corporate level, since providing and promoting the use of formula allows WIC to operate at its current rate and to serve far more families than they would otherwise. WIC is in the difficult position of supporting over 50% of the nation’s infants, while simultaneously receiving a fraction of the budget of other public assistance programs. It is imperative that the organization find a way to alleviate the financial need without creating a conflict of interest that has the potential to detrimentally affect those they strive to serve.
METHODS

Study Design

This qualitative descriptive study includes a breastfeeding attitudes survey designed for this study (Appendix A) that will be provided to WIC Nutritionists from Gwinnett, Rockdale, and Newton County Health Departments with the permission of their WIC clinic director. The survey will include ten questions: three regarding demographic data, three clarifying that the clinics in question are taking part in the breastfeeding promotion activities discussed above, and the remaining four regarding the perceived barriers and interventions for breastfeeding at the clinics. A letter of invitation and instructions for completing the online survey (Appendix B) was delivered to the WIC Nutritionists electronically via their work email address.

Study Population

The study population includes WIC Nutritionists from several county health departments in Georgia. The WIC Nutritionists have a bachelor’s degree in dietetics, human nutrition, food and nutrition, nutrition education, food systems management or a closely related field from an accredited college or university. They must also have a statement of completion of a didactic program in dietetics from an accredited program.

Statistical Analysis

Descriptive statistics will be conducted to report the responses to the survey questions for the total population and after subdivision by WIC clinic location. All statistical analyses will be performed using SPSS (version 23.0, SPSS, Inc., Chicago, IL).
RESULTS

A total of 27 WIC Nutritionists from three counties in Georgia completed the survey. All of the nutritionists surveyed were female, and most had worked for WIC for 1-5 years. The majority of those surveyed are working at clinics in Gwinnett County, Georgia. All of the participants reported that the promotion of breastfeeding is part of the job description of a WIC Nutritionist (Question 5), that their clinics provide breast pumps for mothers who wish to breastfeed (Question 8), and that their clinics have peer counseling groups for mothers who wish to breastfeed (Question 9).

Table 2. Demographic Characteristics of the WIC Nutritionist Population

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Female</td>
<td>27 (100)</td>
</tr>
<tr>
<td>Length of Employment (years)</td>
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<tr>
<td>1 to 5</td>
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<td>5 to 10</td>
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<tr>
<td>&gt;10</td>
<td>6 (22)</td>
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<tr>
<td>WIC Location</td>
<td></td>
</tr>
<tr>
<td>Newton</td>
<td>3 (11)</td>
</tr>
<tr>
<td>Gwinnett</td>
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<tr>
<td>Rockdale</td>
<td>4 (15)</td>
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<tr>
<td>District Office</td>
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</tbody>
</table>

WIC – Women, Infants and Children
The answers to questions 4 and 6 appear in Figures 1 and 2, respectively. The vast majority of the population indicated that they believe breastfeeding is vitally important (77.8%), with 22.2% indicating that though breastfeeding is important, there are other considerations (Figure 1). None of the WIC Nutritionists reported that they believed that breastmilk and infant formula are equally nutritious for infants.

Figure 1. WIC Nutritionist Opinion about the Importance of Breastfeeding

Almost all of the WIC Nutritionists 92.6% responded that they were very likely to discuss breastfeeding with pregnant mothers (Figure 2). A small percentage (3.7%) reported they were somewhat likely to discuss breastfeeding, and 3.7% skipped the question.
Figure 2. WIC Nutritionist Response to How likely they were to Talk to a Pregnant Mother about Breastfeeding during the Initial Counseling Session

The responses to question 7 regarding the primary barriers to talking to pregnant mothers, were fairly evenly divided, though the most common response (37%) was that the mother seemed uninterested (Figure 3). The second most common barrier was time (30%) followed by “other” (19%) and lastly the mother came to WIC for formula (15%). For those WIC Nutritionists that responded “Other” to this question, 4 out of 5 (80%) responded with a variant of the statement that there was no barrier, and that they always made discussed breastfeeding with pregnant mothers. All of the WIC centers are providing breast pumps and peer support groups for mothers who desire to breastfeed.
The responses for question 10, much like question 7, were fairly evenly divided among the respondents (Figure 4). When asked which intervention would be best suited for their clinic, a slight majority (26%) chose an educational program for family members of the mother. Many of the nutritionists wrote alternative answers, and of those, two stated that mothers report insufficient support from other healthcare staff, and one suggested a community education program for mothers outside of the WIC setting.
Figure 4. WIC Nutritionist Response to which Interventions would be Best Suited for Implementation in their Clinic

The data was further analyzed based on which interventions were favored by those who chose each barrier (Table 2). Those that identified time and the belief that mothers came to WIC for infant formula as a primary barriers were more likely to choose more time with pregnant mothers as an intervention. Those who identified the mother’s lack of interest or other barriers had responses that were evenly divided between the response options.
Table 3. Relationships between Barriers to Breastfeeding and Interventions

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Intervention</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time</strong></td>
<td>More time with pregnant mothers</td>
<td>37.5%</td>
</tr>
<tr>
<td></td>
<td>An educational program for family members of the mothers</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>The development of partnerships with Baby Friendly Hospitals</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>Training programs for other healthcare staff</td>
<td>25%</td>
</tr>
<tr>
<td><strong>The mother seemed uninterested</strong></td>
<td>More time with pregnant mothers</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>An educational program for family members of the mothers</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>The development of partnerships with Baby Friendly Hospitals</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Training programs for other healthcare staff</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>10%</td>
</tr>
<tr>
<td><strong>The mother came to WIC for formula</strong></td>
<td>More time with pregnant mother</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>An educational program for family members of the mothers</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>The development of partnerships with Baby Friendly Hospitals</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Training programs for other healthcare staff</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>More time with pregnant mothers</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>An educational program for family members of the mothers</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>The development of partnerships with Baby Friendly Hospitals</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Training programs for other healthcare staff</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>10%</td>
</tr>
</tbody>
</table>
Barriers to breastfeeding and suggested interventions were examined by the location of the WIC Nutritionist (Table 3). Nutritionists from each county reported different barriers that they perceived and therefore favored different interventions. For instance, the majority both Newton and Rockdale nutritionists reported other barriers. Newton nutritionists favored educational programs while more Rockdale nutritionists wrote other interventions. Finally, Gwinnett nutritionist reported disinterested mothers as the primary barrier to discussing breastfeeding and favored more time with mothers and partnerships with Baby Friendly Hospitals for interventions, though their intervention preferences were diverse.
<table>
<thead>
<tr>
<th>Location</th>
<th>Barrier</th>
<th>Percentage</th>
<th>Interventions</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newton</td>
<td>Mother seemed uninterested</td>
<td>33.3%</td>
<td>Educational Programs</td>
<td>66.7%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>66.7%</td>
<td>Partnerships with Baby Friendly Hospitals</td>
<td>33.3%</td>
</tr>
<tr>
<td>Gwinnett</td>
<td>Time</td>
<td>35.3%</td>
<td>More time</td>
<td>29.4%</td>
</tr>
<tr>
<td></td>
<td>Mother seems uninterested</td>
<td>41.2%</td>
<td>Educational programs</td>
<td>23.5%</td>
</tr>
<tr>
<td></td>
<td>The mother came to WIC for formula</td>
<td>23.5%</td>
<td>Partnerships with Baby Friendly Hospitals</td>
<td>29.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Training programs for healthcare staff</td>
<td>11.8%</td>
</tr>
<tr>
<td>Rockdale</td>
<td>Time</td>
<td>25%</td>
<td>Training programs for healthcare staff</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>75%</td>
<td>Other</td>
<td>50%</td>
</tr>
<tr>
<td>District Office</td>
<td>Time</td>
<td>50%</td>
<td>Educational program for family members</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Mother seems uninterested</td>
<td>50%</td>
<td>Training program for healthcare staff</td>
<td>50%</td>
</tr>
<tr>
<td>No answer</td>
<td>Mother seems uninterested</td>
<td>100%</td>
<td>Training program for healthcare staff</td>
<td>100%</td>
</tr>
</tbody>
</table>
DISCUSSION

WIC Nutritionists are a unique group of well-trained individuals that have the potential to impact mothers’ decisions about how to feed their infants and young children. As anticipated, all of the WIC Nutritionists surveyed in this study reported that breastfeeding is vitally important to the health of an infant and the vast majority are very likely to discuss the benefits of breastfeeding during their initial counseling session. These nutritionists also identified disinterest by the mother as the primary barrier to talking to mothers about breastfeeding. This differs from our original expectation that insufficient time would be reported as the primary barrier. The most common intervention chosen by the WIC Nutritionists was an educational program for family members of the mother, followed closely by partnerships with Baby Friendly Hospitals and more time with the mothers. This observation differs from our expectation that more time with the mother during the initial session would be the favored intervention.

Nearly half of the infants in the United States are served by WIC. While no studies have surveyed WIC Nutritionists to determine their attitudes on matters related to breastfeeding, other factors that affect breastfeeding rates have been fairly well studied. Breastfeeding rates are dependent on education of the mother, age of the mother, family support, and family income. In essence, older mothers with more family support, higher income, with higher education are likely to breastfeed longer than younger mothers without family support, lower income, and less education. WIC mothers have low family income, which is how they qualify for the service, and is associated with lower
breastfeeding rates in the United States.\textsuperscript{22} However, WIC is dedicated to supporting breastfeeding. Therefore, it is understandable and expected that its nutritionists would understand the importance of breastfeeding support.\textsuperscript{27}

Although pregnant mothers may understand the importance of breastfeeding, diverse internal and external barriers for mothers can potentially keep them from taking advantage of the benefits breastfeeding provides for both mother and infant.\textsuperscript{7,8,19,20,23} This survey found that mothers’ disinterestedness, and not time, was the primary barrier to discussing breastfeeding with new mothers. This could be because these mothers have tried breastfeeding with another child without success, are unaware of the benefits, or simply does not have the option due to work constraints. It would make sense, then, that educational programs would be the most popular intervention chosen by WIC Nutritionists, based on the assumption that an understanding of the importance of breastfeeding would result in a higher amount of interest. Breastfeeding support needs to be a societal attitude, and not simply an expectation of the mother.\textsuperscript{18,25} WIC Nutritionists are a vital part of the societal support of WIC mothers, and understanding the barriers they face to open discussions about breastfeeding is pivotal to an understanding of breastfeeding promotion in the United States.

The possible WIC clinic interventions that were selected for the study questionnaire were chosen from those identified as beneficial to initiation and duration of breastfeeding.\textsuperscript{25} Any of the interventions chosen have been shown to lead to positive outcomes in breastfeeding rates. Breastfeeding intentions are usually established by the third trimester.\textsuperscript{25} Therefore, it is important that WIC Nutritionists provide information
and implement interventions as early as possible to impact the mothers’ attitude toward breastfeeding.

WIC mothers have been found to be less likely to breastfeed than non-WIC mothers, even those who qualified for WIC. Because of this, it may be presumed that WIC Nutritionists do not know the benefits of breastfeeding or discuss them with their clients, or perhaps that WIC is not following through on their established interventions to promote breastfeeding. This was not observed in our study. All of the WIC Nutritionists surveyed stated that breastfeeding was important and that their clinics were providing pumps and peer counseling groups for the mothers that desired to breastfeed. If the difference in breastfeeding rates differs between WIC and non-WIC mothers in the WIC clinics surveyed in our study, this does not seem to be due to any lack of understanding on the part of WIC Nutritionists.

While WIC is a factor in the decision to initiate breastfeeding, it is by no means the only one. As previously discussed, there are a variety of social and economic factors that play a role in a mother’s decision to exclusively breastfeed. These factors include the mother’s race/ethnicity, education level, age group, and marital status, whether the child ever received WIC benefits, and the income to poverty ratio can play a role in this decision. Another important factor is the opinion of the father, which has been shown to affect a mother’s decision to exclusively breastfeed, as well as the mother’s perception of the opinions of healthcare workers.

The results of the survey did not give a definitive intervention that can be recommended to all WIC clinics. However, it is understandable that different clinics would have different needs. Though these clinics are all located in counties in Georgia,
each serves a different population whose needs are specific and whose culture is unique. The demographics shown in Table 1 illustrate the differences in population among these counties. Rockdale has the highest percentage of African American residents and Gwinnett has the highest percentage of Hispanic Non-White residents. Newton is fairly evenly split between White Non-Hispanic and African American residents with little diversity other than these two groups. It is logical, therefore, that no single barrier or intervention would be preferred by those serving such distinct groups.

This study has several limitations. We surveyed WIC clinics in three counties in Georgia. Because of this, the results from the survey cannot be generalized to other WIC clinics in Georgia or to WIC clinics in other states. In addition, the survey population was small. In order to limit the time required for survey completion, the survey was short and did not examine any potential causes for the barriers that were selected by the WIC Nutritionists. Many of the nutritionists also wrote in answers that were not included in the tables and percentages, though they were helpful and insightful to the researchers.

As WIC continues to provide their services and work toward their goal of breastfeeding promotion, it would be ideal if, as one nutritionist wrote, all of the suggested interventions could be put into place. WIC has already accomplished so much to promote health in the population they serve that many interventions have already been put into place. However, as pointed out by Rollins et al., (2016) “the world is still not a supportive and enabling environment for most women who want to breastfeed.” Breastfeeding is a subject that is largely relegated to those directly associated with a woman who is pregnant, and its benefits are not widely understood or discussed at the policy level.
This study showed that WIC Nutritionists are advocates of breastfeeding. While it is certainly important for them to continue to advocate to the mothers they serve every day, the next step would be, as one nutritionist wrote, to advocate outside of the WIC setting so that women have had the opportunity to think about this important subject before they are faced with it during the stress of pregnancy. The National WIC Association is the advocacy voice of WIC, and includes toolkits and blogs about recent advocacy efforts on the part of WIC. In this way, WIC is able to promote breastfeeding by creating awareness campaigns and attempting to otherwise impact policy, which was one of their key messages in 2016. This places WIC at the forefront of creating an enabling environment for women who want to breastfeed in the United States.

WIC is an important part of breastfeeding support for the mothers it serves. For this reason, understanding the barriers WIC Nutritionists face to discussing breastfeeding and making an effort to intervene where possible is important. We conclude that WIC nutritionists in Gwinnett, Newton, and Rockdale counties have positive attitudes toward breastfeeding and provide support for mothers seeking it in the form of education and resources early in pregnancy. It is important to encourage attempts to improve interest in breastfeeding as well as create a culture of support in WIC clinics. Each clinic should have the freedom to determine the key barriers to breastfeeding in their clinic population and find evidence-based interventions that will best serve their clients. Such interventions may include examining the effect of antenatal and postnatal support for mothers, fathers, and other family members; assessing the effect of more time with lactating mothers to discuss the benefits of breastfeeding as well as assist with any problems or barriers the mother may be having or even post-discharge telephone calls for support. In any case,
interventions that target more than one period of the mother’s pregnancy are the most effective.\textsuperscript{25}
REFERENCE


6. FNS. WIC breastfeeding data local agency report. 2015.


27. USDA. *Breastfeeding Promotion and Support in WIC.*; 2016.


29. Jensen E, Labbok M. Unintended consequences of the WIC formula rebate program on infant feeding outcomes: will the new food packages be enough? *Breastfeed Med*. 2011;6(3).


37. National WIC Association. Advocacy Central