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Public Opinions About Infant Feeding in the United States

Jennifer M. Nelson, MD, MPH^{1,2}, Ruowei Li, MD, PhD², Cria G. Perrine, PhD², Kelley S. Scanlon, PhD, RD²

¹Epidemic Intelligence Service, Division of Scientific Education and Professional Development, Center for Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention, Atlanta, GA

²Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, Atlanta, GA

Abstract

Background: Exclusive breastfeeding is recommended for the first six months of life.

However, many barriers to breastfeeding exist. We examine public opinions about the benefits of breastfeeding and the infant health risks associated with formula feeding.

Methods: A national public opinions survey was conducted in 2013. Participants indicated their level of agreement with four breastfeeding-related statements. Except for the last one, all statements were positively worded with agreement representing positive opinions towards breastfeeding. To focus on the prevalence of positive opinions, we estimated percentage agreement with the first three statements, but disagreement with the fourth. Multiple logistic regression was used to examine how odds of these positive opinions varied by socio-demographic factors.

Results: Seventy-eight percent of participants agreed that breast milk is nutritionally designed for infants, but few believed breastfeeding protects against overweight (12%). Approximately one-quarter agreed that formula feeding increases the chance of illness, whereas 45% disagreed that infant formula is equivalent to breast milk. Older, less educated, unmarried, and non-Hispanic black participants were less likely to agree that formula feeding increases the risk of infant illness. Races other than non-Hispanic white, participants aged 30-44 years and 45-59 years, unmarried, and less educated participants were less likely to disagree with the equivalence of infant formula to breast milk.

Discussion: The nutritional value of breast milk is well known. Fewer adults believe that breastfeeding protects against childhood overweight or that formula feeding increases the chance

*Corresponding author and reprint contact Jennifer M. Nelson, MD, MPH, Epidemic Intelligence Service Officer, Nutrition Branch, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, 4770 Buford Hwy NE, Mailstop F-77, Atlanta, GA 30341. jnnelson@cdc.gov.

Ruowei Li, MD, PhD, Senior Epidemiologist, Nutrition Branch, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention

Cria G. Perrine, PhD, Infant Feeding Team Lead, Nutrition Branch, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention

Kelley S. Scanlon, PhD, RD, Branch Chief, Nutrition Branch, Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention

Conflict of Interest

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of infant illness. Communication efforts may increase public awareness of the health benefits of breastfeeding.

Keywords

breastmilk; breastfeeding; infant formula; public opinion

Background

It is well documented that breast milk is the best source of infant nutrition and immunologic factors that protect infants from illness (1, 2). Breastfeeding has been shown to reduce upper and lower respiratory tract infections, gastrointestinal infections, childhood leukemia, and sudden infant death syndrome, among other health conditions (1-5). Breastfeeding has also been associated with a reduction in childhood overweight and obesity (2, 6, 7). As such, the American Academy of Pediatrics recommends that mothers exclusively breastfeed their infants for the first 6 months of life (1); however, only 22% of infants in the United States (U.S.) are meeting this recommendation (8). Many factors are thought to contribute to low breastfeeding rates.

Among multiple barriers to successful breastfeeding in the United States that are outlined in The Surgeon General's Call to Action to Support Breastfeeding (9), one barrier is related to the social norms within a mother's living environment. For example, many people consider formula feeding as the standard way to feed infants, especially African-American mothers (10). Hispanic women also favor the practice "best of both," in which they perceive feeding both breast milk and infant formula provides the infant with the nutrients from breast milk as well as vitamins from formula (11). Some also hold the false belief that larger babies are healthier, a misperception that can lead to formula feeding (11, 12) and an earlier than recommended introduction of solid foods (12). Another barrier to successful breastfeeding is the lack of knowledge about the health benefits of breastfeeding and the risks associated with formula feeding (9).

Since a mother's breastfeeding behavior is influenced by social norms and opinions of people around her, it is important to understand public opinions towards breastfeeding. Thus, the purpose of this study is to examine public opinions about the benefits of breastfeeding and the infant health risks associated with formula feeding.

Methods

We analyzed data from the 2013 SummerStyles, a cross-sectional, national, online survey conducted by Porter Novelli on public opinions about various health-related issues. The sample originated from KnowledgePanel, which is the largest national, probability-based online panel. Detailed methods describing KnowledgePanel recruitment and sampling have been published elsewhere (13). Briefly, approximately 50,000 adults aged 18 years and older in the KnowledgePanel were recruited by probability-based sampling, utilizing both random-digit dialing and address-based sampling methods. All surveys were conducted online and panelists were provided a laptop computer and internet access, if needed.

From March 29 to April 16, 2013, a random sample of 11,188 KnowledgePanel panelists were sent an initial survey, SpringStyles. Non-responders were sent email reminders; selected demographic groups, including participants aged 18-34 years, non-Hispanic blacks and Hispanics, and those with less than a high school education were sent additional reminders to ensure an adequate response rate. Participants could exit the survey at any time and were not required to answer every question. However, those who did not answer at least 50% of questions were removed (n=50), leaving 6,717 completed surveys for a 60% response rate.

KnowledgePanel panelists who completed the SpringStyles survey were eligible for a follow-up survey called SummerStyles, which was sent from June 28 to July 26, 2013 to 6,105 adults, including a random sample of 4,497 panelists ages 18 years or older who had completed SpringStyles as well as a supplemental sample of 1,608 panelists who had children ages 12-17 years. Panelists with children ages 12-17 years were oversampled in order to collect adult-youth dyad data for a parallel study. One reminder email per week was sent during the 4 week survey period to those who had not completed the survey. Similar to SpringStyles, participants could exit the survey at any time and were not required to answer every question. However, participants were removed if they answered less than 50% of the questions (n=79). A total of 4,033 participants completed the SummerStyles survey for a response rate of 66%. Participants who completed either SpringStyles or SummerStyles surveys were eligible to win an in-kind prize through a monthly sweepstakes. This study was deemed exempt from IRB review since no personal identifiable information could be determined in this secondary data analysis.

Dependent and Independent Variables

In the 2013 SummerStyles survey, there were four statements related to the benefits of breastfeeding including: 1) “breast milk is specially designed to meet a baby’s nutritional needs,” 2) “if a child is not breastfed, she/he will be more likely to become overweight,” 3) “feeding a baby formula instead of breast milk increases the chances the baby will get sick,” and 4) “infant formula is as good as breast milk.” For each statement, participants were asked to indicate their agreement on a 5-point Likert scale (1=strongly disagree, 2=somewhat disagree, 3=neither agree nor disagree, 4=somewhat agree, and 5=strongly agree). For this analysis, responses 4 and 5 were aggregated to indicate agreement, or positive opinions about breastfeeding, and responses 1, 2, and 3 were aggregated to indicate disagreement, or negative opinions about breastfeeding for all statements except “infant formula is as good as breast milk.” For this statement, which is negatively worded, responses 3, 4, and 5 were aggregated to indicate agreement, or negative opinions about breastfeeding, and responses 1 and 2 were aggregated to indicate disagreement, or positive opinions about breastfeeding. Independent variables included: sex (male vs. female), race/ethnicity (non-Hispanic white, non-Hispanic black, other non-Hispanic, and Hispanic), age (18-29 years, 30-44 years, 45-59 years, and 60 years), marital status (married vs. unmarried), population density (metro vs. non-metro), education (less than high school, high school graduate, some college, bachelor’s degree or higher), employed (yes vs. no), and household income (<\$20,000, \$20,000 to \$49,999, \$50,000 to \$99,999, \$100,000).

Statistical Analysis and Sample

There were 4,033 participants who completed the SummerStyles survey; of which, 68 were missing information on level of agreement to at least one of the statements, leaving an unweighted sample of 3,965 for analysis. This sample was weighted on gender, age, household income, race/ethnicity, household size, education, census region, metro status, and prior internet access in order to match the U.S. Current Population Survey proportions. To focus the analysis on the prevalence of positive opinions about breastfeeding, we estimated percentage agreement for the three positively worded statements, but disagreement with the one negatively worded statement. Multiple logistic regressions were used to examine how odds of these positive opinions varied by a series of socio-demographic factors including sex, race/ethnicity, age, marital status, population density, education, employment, and household income as these characteristics are known to influence a woman's decision to breastfeed. All analyses were conducted in SAS 9.3 (SAS Institute, Inc., Cary, NC).

Results

Demographic characteristics of the sample are presented in Table 1. Among the 3,965 participants, a majority were: female, non-Hispanic white, aged 45 years or older, married, and lived in a metro area. Over 50% of participants had at least some college education, were employed, or had a household income of \$50,000.

Seventy-eight percent of participants agreed that breast milk is designed to meet a baby's nutritional needs (Table 2). The odds of agreement were significantly greater among participants aged >60 years (vs. 18-29 years) and those with a household income \$20,000 to \$49,999 (vs. \$100,000). The odds of agreement were significantly lower among non-Hispanic black and persons of other non-Hispanic race (vs. non-Hispanic white), unmarried, and less educated participants (vs. Bachelor's degree or higher).

Fewer participants (12%) agreed that a child who is not breastfed is more likely to become overweight. The odds of agreement for this statement were significantly lower among participants who were 45 years or older (vs. 18-29 years), unmarried, and less educated (vs. Bachelor's degree or higher), and significantly greater among Hispanics (vs. non-Hispanic white). Twenty-four percent of participants agreed that feeding a baby infant formula instead of breast milk increases the chance the baby will get sick (Table 2). The odds of agreement were significantly greater among other non-Hispanic race participants (vs. non-Hispanic white) and lower among non-Hispanic blacks (vs. non-Hispanic white), older participants (30 years vs. 18-29 years), unmarried, and less educated participants (vs. Bachelor's degree or higher). Further, only 45% of participants disagreed with the statement that infant formula is as good as breast milk. Races other than non-Hispanic white, participants aged 30-44 and 45-59 years (vs. 18-29 years), unmarried, and participants with less education (vs. Bachelor's degree or higher) were less likely to disagree with this statement suggesting less positive opinions among these subgroups.

Discussion

Survey participants had a mixed understanding of the general benefits of breast milk to the infant. Overall, three of four adults surveyed agreed that breast milk is specifically designed to meet an infant's nutritional needs but only 45% disagreed that infant formula is as good as breast milk. Fewer participants understood specifically how breast milk protects infants. Only one in four believed that feeding infant formula instead of breast milk places infants at higher risk for illness and only 12% of participants agreed that breastfeeding protects infants from becoming overweight.

Less than one-half of participants disagreed with the statement "infant formula is as good as breast milk." When infants are fed formula, they miss receiving the protective benefits inherent to breast milk, including antimicrobials, anti-inflammatory factors, immunoglobulins, and bioactive factors (14). Infant formula does not contain these protective factors and, therefore, does not protect infants from infection (15). This message could be communicated to the public to highlight differences between breast milk and infant formula in order to increase understanding that these infant feeding methods are not equivalent.

Few participants agreed that a child who is not breastfed is more likely to become overweight. The mechanism behind how breastfeeding may protect children from becoming overweight is not fully understood and likely multi-factorial, potentially including less interruption of an infant's self-regulation of energy intake when the infant is fed at the breast rather than through a bottle (16). Regardless of the mechanism, epidemiologic data suggests breastfed infants are less likely to become overweight (2, 6, 7) and this message is not being received by the public. Thus, efforts to inform the public that children who are not breastfed may be at increased risk of becoming overweight and obese may be beneficial.

In our study, only 24% of participants agreed that infant formula instead of breast milk increases the chance of illness. Li et al. (17), using similar methods, also found that only 22% and 24% in 1999 and 2003, respectively, of the public agreed that formula increases the chance of infant illness. In contrast, McCann et al. (18) found that three-fourths of mothers in a Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) survey agreed with the statement, "breastfeeding helps protect the baby from diseases;" however, agreement to specific questions about how breast milk protects was low. For example, only 46% and 36% of participants agreed that breast milk protects against ear infections and diarrhea, respectively. Of note, while the WIC and HealthStyles questions share the theme that breastfeeding protects from illness, these questions are worded differently which may explain some of the discrepancy between the results. Another potential reason for these differences may be that WIC mothers are exposed to more prenatal and postnatal education and peer-to-peer counseling on the health benefits of breastfeeding. Thus, there is need for continued messaging to the public on how breast milk specifically protects infants from becoming sick, such as protection from ear infections and diarrhea.

Nationally, there have been social marketing campaigns, each with a different theme, to promote breastfeeding to the U.S. public (19). In 2013, the campaign *It's Only Natural*

was launched to communicate to African-American women and their families the health benefits of breastfeeding and increase breastfeeding support among the population (20). The National Breastfeeding Awareness Campaign, launched in the early 2000s, was specifically designed to increase awareness of the risks of not breastfeeding and to establish breastfeeding as the standard method of infant feeding (21). Evaluation of this campaign suggests that it had some impact in educating the public that infant formula is not equivalent to breast milk and that breastfeeding reduces a child's chances of illnesses. Despite this success, continued efforts, as outlined in The Surgeon General's Call to Action to Support Breastfeeding (9), are needed to inform the U.S. public about the potential risks of formula feeding in relation to infant illness and childhood overweight and obesity.

This study has several strengths and limitations. Unlike many consumer opinion surveys where the panelist chooses to participate (i.e., an "opt-in" panel), persons in the SummerStyles survey were selected to be panelists. As such, response and completion rates for the survey were high; however, persons selected to participate in the KnowledgePanel overall must be willing to complete several surveys each month and may have stronger opinions from those that are not willing to participate in such panels. Further, the sampling strategy with post-stratification weighting was designed to ensure a representative sample, but these data may not truly reflect the general opinions of the U.S. population as only limited factors are adjusted in the weighting procedure.

Conclusions

The U.S. adults surveyed generally agree that breast milk is designed to meet an infant's nutritional needs. However, far fewer believed that breastfeeding protects against childhood overweight and that feeding infant formula instead of breast milk increases the chance of infant illness. Continued efforts are needed to communicate with the general public about the health benefits of breastfeeding compared to infant formula feeding.

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Table 1:

Demographic Characteristics of SummerStyles Participants, 2013

		No. (%)
Total		3,965 (100)
Sex		
	Female	2,075 (52)
	Male	1,890 (48)
Race/ethnicity		
	Non-Hispanic White	3,035 (77)
	Non-Hispanic Black	358 (9)
	Hispanic	362 (9)
	Other Non-Hispanic	210 (5)
Age (yrs)		
	18-29	483 (12)
	30-44	899 (23)
	45-59	1,358 (34)
	60	1,225 (31)
Marital status		
	Married	2,332 (59)
	Unmarried	1,633 (41)
Population density		
	Metro	3,329 (84)
	Non-Metro	636 (16)
Education		
	Less than High School	268 (7)
	High School graduate	1,135 (29)
	Some college	1,242 (31)
	Bachelor's degree or higher	1,320 (33)
Employed		
	Yes	2,255 (57)
	No	1,710 (43)
Household income		
	<\$20,000	422 (11)
	\$20-49,999	1,187 (30)
	\$50-99,999	1,446 (36)
	\$100,000	910 (23)

Table 2:

Percentage Representing the Positive^a Public Opinion to Statements Regarding Breast Milk, SummerStyles 2013

	"Breast milk is specially designed to meet a baby's nutritional needs."		"If a child is not breastfed, she/he will be more likely to become overweight."		"Feeding a baby formula instead of breast milk increases the chances the baby will get sick."		"Infant formula is as good as breast milk."	
	% agree	Adjusted OR (95% CI)	% agree	Adjusted OR (95% CI)	% agree	Adjusted OR (95% CI)	% disagree	Adjusted OR (95% CI)
Total	78		12		24		45	
Sex								
Female	79	Reference	13	Reference	24	Reference	46	Reference
Male	76	0.90 (0.77—1.05)	12	0.94 (0.77—1.15)	23	0.99 (0.85—1.15)	44	0.96 (0.84—1.09)
Race/ethnicity								
Non-Hispanic White	80*	Reference	11*	Reference	24*	Reference	49*	Reference
Non-Hispanic Black	68	0.60 (0.48—0.76)	12	1.34 (0.98—1.84)	15	0.64 (0.48—0.84)	36	0.66 (0.53—0.81)
Hispanic	76	0.89 (0.71—1.12)	17	1.63 (1.25—2.12)	25	1.07 (0.86—1.34)	40	0.73 (0.60—0.88)
Other Non-Hispanic	74	0.62 (0.46—0.83)	16	1.32 (0.94—1.87)	33	1.37 (1.04—1.79)	37	0.56 (0.43—0.72)
Age (yrs)								
18-29	72*	Reference	16*	Reference	28*	Reference	46*	Reference
30-44	82	1.27 (1.00—1.61)	17	0.78 (0.59—1.04)	28	0.77 (0.62—0.97)	47	0.78 (0.64—0.95)
45-59	75	1.07 (0.86—1.34)	9	0.47 (0.35—0.63)	20	0.58 (0.46—0.72)	41	0.74 (0.61—0.90)
> 60	80	1.29 (1.01—1.64)	9	0.48 (0.35—0.65)	19	0.52 (0.41—0.66)	47	0.88 (0.71—1.08)
Marital status								
Married	82*	Reference	13	Reference	25*	Reference	49*	Reference
Unmarried	72	0.70 (0.59—0.83)	12	0.76 (0.61—0.94)	22	0.77 (0.65—0.90)	41	0.79 (0.69—0.91)
Population density								
Metro	78	Reference	12	Reference	24	Reference	46	Reference
Non-Metro	77	1.03 (0.83—1.29)	13	1.30 (0.99—1.71)	24	1.14 (0.92—1.40)	45	0.98 (0.82—1.18)
Education								
Less than High School	68*	0.42 (0.32—0.55)	13*	0.65 (0.46—0.90)	16*	0.41 (0.31—0.55)	32*	0.40 (0.32—0.51)

	"Breast milk is specially designed to meet a baby's nutritional needs."	"If a child is not breastfed, she/he will be more likely to become overweight."	"Feeding a baby formula instead of breast milk increases the chances the baby will get sick."	"Infant formula is as good as breast milk."
	% agree	Adjusted OR (95% CI)	% agree	Adjusted OR (95% CI)
graduate	72	0.46 (0.37—0.58)	8	0.39 (0.29—0.52)
Some college	80	0.69 (0.54—0.87)	13	0.65 (0.51—0.84)
Bachelor's degree or higher	86	Reference	18	Reference
Employed				
Yes	80*	Reference	14*	Reference
No	75	0.86 (0.72—1.02)	11	1.01 (0.81—1.26)
Household income				
<\$20,000	65*	0.78 (0.59—1.03)	11	1.17 (0.80—1.71)
\$20-49,999	80	1.33 (1.04—1.69)	11	1.07 (0.81—1.43)
\$50-99,999	78	0.94 (0.76—1.17)	13	1.09 (0.85—1.41)
> \$100,000	81	Reference	14	Reference
			20*	1.11 (0.82—1.49)
			25	1.23 (0.99—1.53)
			22	0.89 (0.73—1.08)
			27	Reference
			41	0.54 (0.45—0.65)
			47	0.70 (0.58—0.83)
			55	Reference
			47*	Reference
			43	0.94 (0.82—1.09)
			34*	0.88 (0.68—1.14)
			45	1.16 (0.96—1.40)
			47	1.07 (0.90—1.27)
			49	Reference

^aPositive public opinion indicates agreement for all statements except "Infant formula is as good as breast milk," in which disagreement represents the positive opinion.

* p< 0.05 in unadjusted analysis.