

The Effects of In-store Marketing of Infant Formula and Lactation Support Products Among Stores in Black and White Zip Codes Across Los Angeles County

Skye Shodahl
University of California Los Angeles

Meeta Banerjee
University of South Carolina

Aqueelah Russell
Women, Infants & Children Program

Kacie C. A. Blackman
California State University Northridge

Abstract

The World Health Organization adopted the International Code of Marketing of Breastmilk Substitutes to prompt governments to regulate the marketing of artificial supplementation. This code was designed to protect the most vulnerable (babies) by ending unethical infant formula marketing. The United States (U.S.) signed on to support this code, yet there is little governance to enforce it. As a result, infant formula marketing continues to disproportionately target Black families and undermine efforts for breastfeeding promotion in the U.S. This is problematic as rates of breastfeeding among Black populations are consistently the lowest compared to other races/ethnicities (with White populations having highest breastfeeding rates). To gain a deeper understanding of the social barriers to breastfeeding among ethnic minority lactating persons, the current study investigates in-store marketing and health claims of infant feeding products across Black and White communities in Los Angeles County. Trained researchers utilized observational methods to explore marketing aspects and health claims of infant formula, follow-on formula, and galactagogues products in June 2019. This was a cross-sectional study that included 47 retail stores in Black (N=24) and White (N=23) communities across 20 zip codes. Findings indicate that stores in majority White

zip codes, compared to those in majority Black zip codes, had greater multi-pack discount marketing of infant formula and bottled purified water marketed for mixing infant formula (17.4 percent Black vs. 60.9 percent White, $p < 0.01$). Additionally, stores in majority White zip codes, compared to those in majority Black zip codes, had more infant formula products and galactagogue beverage products with health claims on their label. The results of this study suggest a minimal difference in in-store marketing and use of health claims on labels for infant formula, follow-on formula, and galactagogues products between stores in the communities included in this study. Overall, the findings underscore an opportunity for the marketing and education of safe and quality galactagogue products for persons who may be struggling with initiating and maintaining lactation.

Key Words: maternal and infant health, artificial breast milk substitute, marketing strategies, breastfeeding, health disparities

Introduction

OVER RECENT DECADES, infant mortality has been a vital indicator of population health and well-being for the United States (Hummer 1993). Specifically, data trends between national findings and Los Angeles have shown that the infant mortality rates are highest for Black infants (Sankar et al. 2015). Various reasons have been attributed to the high infant mortality rates in Black infants including maternal exposure to interpersonal racial discrimination leading to very low birthweight (Collins et al. 2004). According to the Office of Minority Health, non-Hispanic Blacks have 2.3 times the infant mortality rate as non-Hispanic Whites (Center for Disease and Control 2020). The substantial ethnic/racial disproportion of infant mortality poses a public health concern and underlines the need to address this persistent epidemic.

Within the existing literature, scholars have identified an association between suboptimal breastfeeding and infant mortality, with Black infants having the lowest prevalence of breastfeeding initiation and duration (Sankar et al. 2015). Various institutional factors have been found to disproportionately affect breastfeeding/reproductive health outcomes among Black women, such as structural racism (e.g., residential segregation, exposure to adverse neighborhood conditions), discriminatory practices (e.g., time and space in workplace for expressing breastmilk, public breastfeeding shaming, less access to paid parental leave), and marketing of artificial supplementation (e.g., infant formula) to Black communities (Culhane and Elo 2005; Tanaka 2005; Langellier, Chaparro, and Whaley 2012; DeVane-Johnson et al. 2018; Goodman, Williams, and Dow 2021). Because a majority of the health claims by infant formula companies are backed by market/consumer research rather than scientific evidence, having a deeper understanding of the types of infant feeding products being promoted to the public is critical

for the advancement of maternal and child health (The Changing Markets Foundation 2017).

Currently, the global artificial breast milk substitute industry is exponentially rising and is estimated to reach 22.1 billion by 2025 (Global Market Insights Inc. 2019). The World Health Organization (WHO) has urged a global adoption of the International Code of Marketing of Breastmilk Substitutes (restricts/regulate marketing of these products; Margulies 1997). Though the United States Food and Drug Administration (USFDA) regulates the nutritional content of commercially available infant formula, it does not regulate the marketing of commercially available infant formulas (e.g., prevents allergies, promotes better sleep) or the disclosure of added sugar content in all infant formulas (The Changing Markets Foundation 2017). Consequently, unclear and inconsistent labeling leaves consumers unaware of the harmful number of added sugars found in infant formula. Some formulas contain double the sugar per serving than a glass of soda, otherwise absent in breastmilk (Bridge, Lomazzi, and Bedi 2020). This is concerning because added sugars can lead to diabetes and obesity later in a child's development (Bridge, Lomazzi, and Bedi 2020). The widespread marketing by the infant formula industry has had and will continue to have an adverse impact on breastfeeding rates (Kaplan and Graff 2008).

In the U.S., racism and classism in distribution of affordable quality resources and geography are primary predictors of breastfeeding (Burnham et al. 2022). Past literature has shown geographic distribution of breastfeeding support (mother-to-mother support groups, peer counselors) that favors communities that were White, affluent, and suburban (Grubestic and Durbin 2021). Further geographic disparities in the use of highly specialized formula that is inconsistent with scientific and evidence-based practices has attributed to the marketing efforts of formula companies (Kemp 2006). In a local report in Los Angeles County, the two geographic areas with highest infant mortality rates also have the highest rates of preterm births, the lowest exclusive breastfeeding rates at three months, the fewest lactation support resources, and the highest number of households with annual incomes between \$12,813 and \$41,400 (BreastfeedLA 2019). Moreover, there is a new crisis with infant formula shortage (slowing distribution; recalls due to bacterial contamination) that is disproportionately harming low-income families. Thus, infant mortality rates are linked to how much and where food is distributed (Padilla 2022).

The increasing adoption of infant formula by working-class people (e.g., manual or industrial) as a result of a lack of paid parental leave and/or adequate paid parental leave coupled with the widespread awareness of artificial breast milk substitutes are the primary factors catapulting the growth of this market (Global Market Insights Inc 2019). There are alternatives to artificial breast milk substitutes with an insufficient milk

supply such as pasteurized donor human milk. Yet, limitations in access to donor milk exist. The lack of education on the use of galactagogue products (i.e., medications or substances that may assist in lactation promotion), inequitable access to lactation support and resources, and persistent promotion of artificial breast milk substitutes in certain communities create barriers that hinder Black individuals' ability to optimally breastfeed.

Studying the marketing of safe galactagogue products within communities of color will further the understanding of social barriers to breastfeeding among ethnic minority lactating persons. Ultimately, this will restrict artificial breast milk substitute marketing on maternal and child well-being. Literature studying the role of in-store marketing of galactagogue products is sparse. Thus, there is a need to add to this body of literature. The current study investigates in-store marketing and health claims of infant formula and galactagogue products across Black and White communities in Los Angeles County.

Methods

Study Sample

Forty-eight stores were initially included in the sample. Of the 48, observational audits were completed in each store except for one in the White community (i.e., refused to participate). Thus, the final sample consisted of 47 stores, 24 in predominately Black neighborhoods and 23 in predominantly White neighborhoods. Per established definitions, store type was comprised of convenience, retail, grocery, discount, pharmacy, and other (Henriksen 2016). Selection of retail stores was based on data from the American Community Survey (U.S. Census Bureau 2017) and utilized a two-step approach (Baezconde-Garbanati et al. 2017; Blackman et al. 2019). Within the larger Los Angeles County area, we focused on two distinct geographical areas (Figure 1). Within Figure 1, the darker blue areas indicate the selected zip codes with higher proportion of White residents, while the darker green areas indicate the selected zip codes with higher proportion of Black residents. In Figure 2, the top ten zip codes with the highest proportion of White residents were chosen for this study and categorized as predominantly White neighborhoods. Similarly, the top ten zip codes with the highest proportion of Black residents were chosen for this study and categorized as predominantly Black neighborhoods (Figure 3). Policy Maps was used as a safeguard to ensure the accuracy of the racial composition of the chosen zip codes (PolicyMaps and Census 2013-2017). Within the chosen zip codes, retail stores were then randomly chosen using the Women, Infant, and Children (WIC) list of stores. Trained data collectors used online searches, telephone calls, and drive-by visual verification to confirm that stores were still in operation and open to the public. The Institutional Review Board has reviewed all study activities and deemed that this study does not involve humans and therefore does not require its approval.

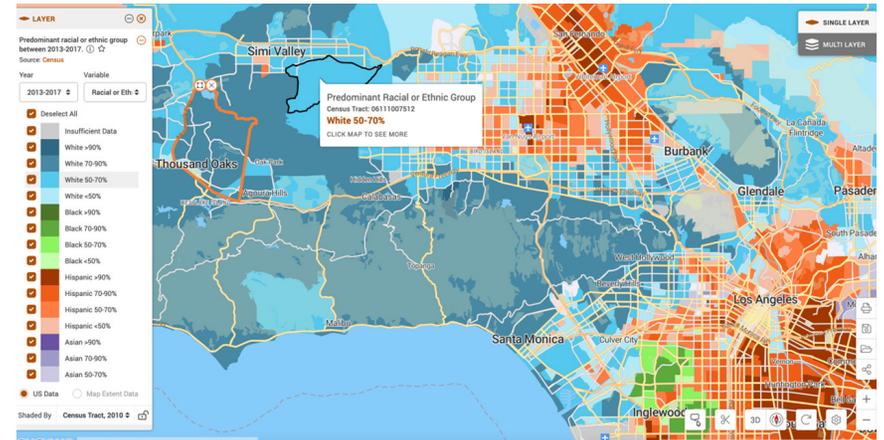


Figure 1. Map of Greater Los Angeles (PolicyMaps and Census 2013-2017).

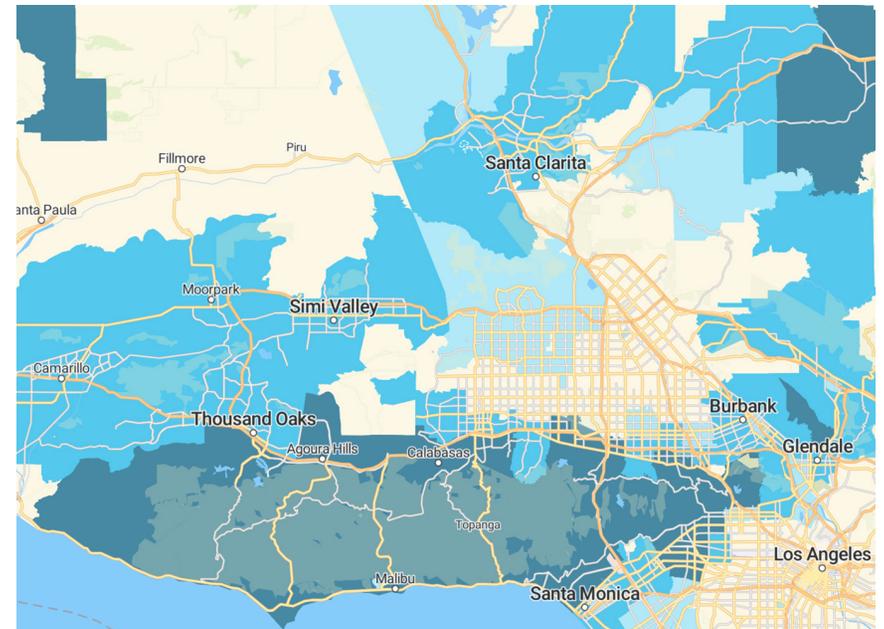


Figure 2. Map of the top ten zip codes with the highest proportion of White residents (PolicyMaps and Census 2013-2017).

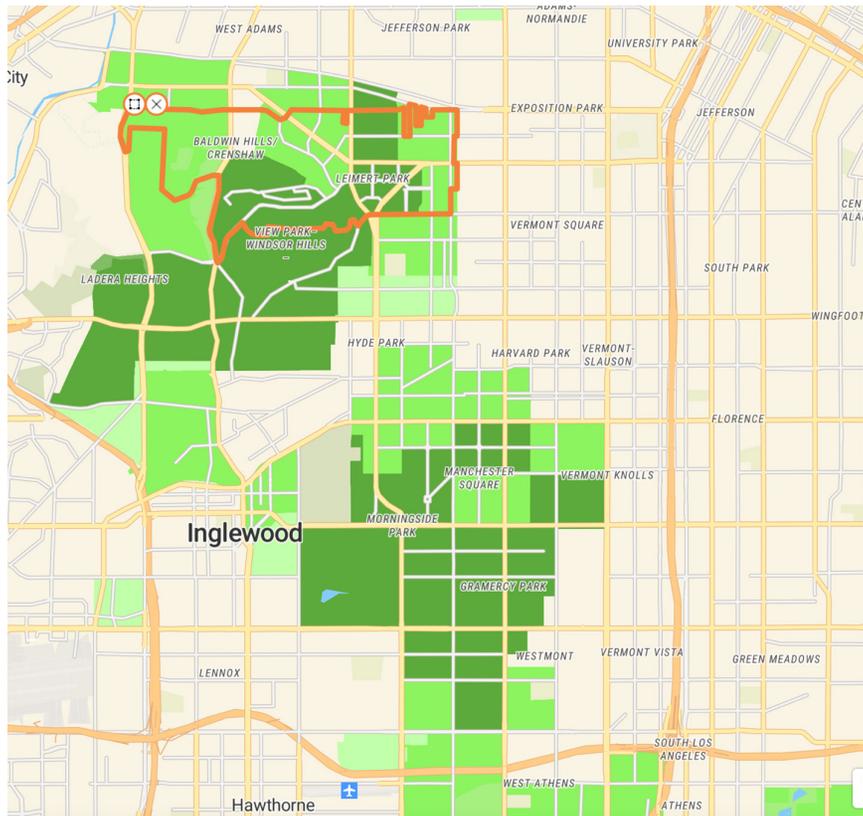


Figure 3. Map of the top ten zip codes with the highest proportion of Black residents (PolicyMaps and Census 2013-2017).

Data Collection

An observational audit was adapted from a Standardized Tobacco Assessment for Retail Settings (STARS; Henriksen 2016). STARS was designed to be a low-cost method to assess retail tobacco product marketing and provide observational data to inform tobacco control policy, planning, and practice. For this current study, only the marketing items will be described. The total number of marketing tactics and health claims included in this study was 14. Each trained data collector went through a two-day training and conducted practice audit runs in four stores. Each data collector completed the audit independently. An interrater reliability of 0.90 was achieved after conducting observations in four stores during pilot testing. Data were collected over a three-week period in June 2019. One store in the non-Hispanic White zip codes refused data collection and was dropped from the analysis.

Measures

Infant Formula

The following types of infant formula products were included: concentrated liquid, powder, ready-to-use formula, follow-up concentrated liquid, and follow-up powder. Infant formula is designed as an artificial supplementation for infants, and follow-on formula is designed for babies ages 6 months and up.

Galactagogue Products

The following three types of galactagogue products were considered in this study: supplements (e.g., vitamins), beverages (e.g., teas), and cookies. Across both products the top manufacturers were examined. These products contain ingredients that are designed to initiate and maintain lactation (e.g., galactagogues-fenugreek, blessed thistle) and may have added iron, vitamins, folic acid, and unsaturated fats. Further, persons with insufficient breast milk output who are not receptive to lactation counseling may be interested in therapy with herbal galactagogues that initiate and maintain lactation (Bazzano 2016).

Bottled Purified Water

Bottled purified water was defined as with or without added fluoride; may have added minerals such as calcium, magnesium, and potassium for taste; no nutritional benefits; marketed for parents to use when mixing infant formula.

Retail Characteristics

The following retail characteristics were included: WIC and Supplemental Nutrition Assistance Program (SNAP) voucher acceptance, median household income of store zip code, and whether alcoholic beverages were sold. SNAP and WIC approved stores were identified through a national list and were verified by the presence of signs posted in the store. National median household income (MHI) was found to be about \$60,000 according to the U.S. Census Bureau for families and households (United States Census Bureau n.d.). In Los Angeles County, the MHI was \$65,000. When broken down between races the MHI was \$40,000 among Black households and close to \$66,000 among non-Hispanic White households. Lastly, stores were examined to see whether they sold alcoholic beverages (Y/N).

Marketing Tactics

Marketing tactics included number of items on interior advertisement (e.g., Were infant formula products advertised inside the store?), number of items on price promotions (e.g., Buy two, receive \$10 gift card), number of items on cross-product promotions (e.g., promotions with diapers/wipes), number of items on multi-pack discounts (e.g., two for \$11), and number of items on exterior advertisement (e.g., Were infant formula products advertised outside the store?).

Various Health Claims

Health claims for infant formula products and galactagogue products were examined. For infant formula products, the following health claims were examined: support brain/cognitive development, maximize absorption/minimize malabsorption, reduce gastrointestinal discomfort (i.e., gas, fussiness), support immune system, non-genetically modified organic (GMO), organic or USDA organic (label present on container Y/N), and pediatrician recommended (label present on container Y/N). For galactagogue products, the following health claims were examined: promotion of healthy milk supply, health benefits beyond galactagogues, non-GMO, and organic or USDA organic. Organic and USDA Organic were combined into a single variable. Data collectors looked for the presence of the aforementioned health claim labels on the product.

Analyses

Chi-squared tests were run to compare the presence of retail characteristics as well as the use of various marketing tactics (i.e., interior advertisement, exterior advertisement, cross-product promotion, price promotion, multi-pack discounts, and various health claims) for different infant feeding products between stores in Black and White zip codes. The present study focuses on the following types of infant food products: 1) infant formula, 2) galactagogue products (i.e., beverages, supplements, and cookies), and 3) bottled purified water. All analyses were conducted in IBM Statistical Packages for Social Sciences (SPSS) version 26.

Results

Retail Characteristics

Table 1 describes the total number, proportion, and chi-squared comparisons of selected retail characteristics across stores in Black and White zip codes. Stores within White zip codes, as compared to those in Black zip codes, sold more alcohol (83.3 percent Black vs. 100 percent White, $p < 0.05$), whereas there were no significant differences in the number of WIC- or SNAP-approved stores between Black and White zip codes. Across the Black zip codes, a total number of 56 stores accepted WIC vouchers; across the White zip codes, only 29 stores accepted WIC vouchers.

Infant Formula

The total number, proportion, and chi-square comparisons of different marketing tactics and various health claims of different infant food products across stores in Black and White zip codes are shown in Tables 2 and 3, respectively. Stores within White zip codes, as compared to

Table 1. Comparison of various retail characteristics between stores in Black and White zip codes.

	Total (N=47)		Stores in Black zip codes (N=24)		Stores in White zip codes (N=23)		p-value
	N	Row %	N	Row %	N	Row %	
FOOD SUPPORT PROGRAMS							
WIC	31	66	18	75	13	56.5	0.18
SNAP	7	14.9	3	12.5	4	17.4	0.64
ABOVE MEDIAN HOUSEHOLD INCOME							
United States (MHI: \$60,336)	24	51	-	-	-	-	-
Black (MHI: \$40,232)	-	-	16	66	-	-	-
Non-Hispanic White (MHI: \$65,845)	-	-	-	-	23	100	-
ALCOHOL	43	91.5	20	83.3	23	100	.041*

*Table 1. Significance is at < 0.05 ; MHI = Median Household Income

those in Black zip codes, had greater promotion of multi-pack discounts (17.4 percent Black vs. 60.9 percent White, $p < 0.01$). Additionally, Table 3 shows stores within White zip codes had significantly more infant formula products that claimed the following benefits: support eye development (50 percent Black vs. 95.7 percent White, $p < 0.01$) and non-GMO (41.7 percent Black vs. 69.6 percent White, $p = .054$). No significant differences were found between stores in Black versus White zip codes for interior advertisement and price promotions. Furthermore, there were no significant differences found between stores in Black and White zip codes for infant formula products that claimed the following benefits: support brain/cognitive development, maximize absorption/minimize malabsorption, reduce gastrointestinal discomfort (i.e., gas, fussiness), organic or USDA organic, and pediatrician recommended. The following marketing tactics were absent from all stores and therefore excluded from analyses: cross-product promotion and exterior advertisement.

Table 2. Comparison of various marketing tactics between stores in Black and White zip codes.

	Total (N=47)		Stores in Black zip codes (N=24)		Stores in White zip codes (N=23)		p-value
	N	Row %	N	Row %	N	Row %	
INTERIOR ADVERTISEMENT							
Infant Formula	16	34.04	6	25	10	43.48	0.18
Galactagogue Products	3	6.38	0	0	3	13.04	0.07
Bottled Purified Water	6	12.77	2	8.33	4	17.39	0.35
PRICE PROMOTION							
Infant Formula	4	8.51	2	8.33	2	8.7	0.97
Galactagogue Products	0	0	0	0	0	0	-
Bottled Purified Water	0	0	0	0	0	0	-
MULTI-PACK DISCOUNTS							
Infant Formula	18	38.3	4	17.39	14	60.87	.002*
Galactagogue Products	0	0	0	0	0	0	-
Bottled Purified Water	17	36.17	3	12.5	14	60.87	.001*

*Table 2. Significance is at <0.05

Galactagogue Products

As shown in Table 3, stores within White zip codes, as compared to those in Black zip codes, had significantly more galactagogue beverage products that claimed the following benefits: non-GMO (8.3 percent Black vs. 39.1 percent White, $p < 0.05$) and organic or USDA organic (12.5 percent Black vs. 39.1 percent White, $p < 0.05$). No significant differences were found between stores in Black versus White zip codes for health claims for galactagogue cookies and galactagogue supplements. Additionally, Table 2 shows that there were no significant differences found between stores in Black versus White zip codes for interior advertisement of galactagogue products. The following marketing tactics were absent from all stores and therefore excluded from analyses: cross-product promotion, exterior advertisement, cross-product promotion, and multi-pack discounts.

Table 3. Comparison of various health claims between stores in Black and White zip codes.

	Total (N=47)		Stores in Black zip codes (N=24)		Stores in White zip codes (N=23)		p-value
	N	Row %	N	Row %	N	Row %	
INFANT FORMULA							
Support brain/cognitive development	46	97.87	23	95.83	23	100	0.32
Maximize absorption/minimize malabsorption	2	4.25	0	0	2	86.96	0.14
Reduce gastrointestinal discomfort (i.e., gas, fussiness)	27	57.44	11	45.83	16	69.56	0.1
Support Immune system	43	91.49	21	87.5	22	95.65	0.32
Support eye development	34	72.34	12	50	22	95.65	.000*
Non-GMO	26	55.32	10	41.67	16	69.56	.054*
Organic/USDA Organic	4	8.51	2	8.33	2	8.7	0.97
Pediatrician Recommended	46	97.87	23	95.83	23	100	0.32
GALACTAGOGUE COOKIES							
Promote healthy milk supply	2	4.26	2	8.33	0	0	0.16
Health benefits beyond galactagogues	1	2.13	1	4.17	0	0	0.32
Non-GMO	5	10.64	1	4.17	4	17.4	0.14
Organic/USDA Organic	3	6.39	0	0	3	13.04	0.07
GALACTAGOGUE SUPPLEMENTS							
Promote healthy milk supply	3	6.38	2	8.33	1	4.35	0.58
Health benefits beyond galactagogues	0	0	0	0	0	0	0
Non-GMO	6	12.77	2	8.33	4	17.39	0.35
Organic/USDA Organic	2	4.26	1	4.17	1	4.34	0.98

Table 3 (continued). Comparison of various health claims between stores in Black and White zip codes.

	Total (N=47)		Stores in Black zip codes (N=24)		Stores in White zip codes (N=23)		p-value
	N	Row %	N	Row %	N	Row %	
GALACTAGOGUE BEVERAGES							
Promote healthy milk supply	7	14.89	3	12.5	4	17.39	0.16
Health benefits beyond galactagogues	2	4.26	2	8.33	0	0	.013*
Non-GMO	11	23.4	2	8.33	9	39.13	.036*
Organic/USDA Organic	12	25.53	3	12.5	9	39.13	.036*

*Table 3. Significance is at <0.05

Bottled Purified Water

As shown in Table 2, stores within White zip codes, as compared to those in Black zip codes, had greater promotion of multi-pack discounts, (12.5 percent Black vs. 60.9 percent White, $p = .001$). No significant differences were found between stores in Black versus White zip codes for interior advertisement. The following marketing tactics were absent from all stores and therefore excluded from analyses: cross-product promotion, exterior advertisement, and price promotions. Furthermore, observations of health claims for bottled purified water products were not collected and therefore were excluded from analyses.

Discussion

The present study sought to explore the in-store marketing tactics of artificial breastmilk substitutes and galactagogue products in Black and White communities within Los Angeles. Overall, there were little differences found in in-store marketing between stores in Black and White communities across infant formula products and galactagogue products. For both Black and White communities, stores lacked the use of any type of in-store marketing. However, when in-store marketing was present, it was predominantly for infant formula products. Furthermore, there was little to no marketing for galactagogue products across stores in both communities. This is not surprising, as infant formula companies have commonly marketed through other sources including hospitals via discharge packs

(Rosenberg et al. 2013), mass media via TV, radio, magazines, newspapers, and the internet, and sending free samples in the mail (Waite and Christakis 2016; Zhang, Carlton, and Fein 2013). In addition, results indicated that there was greater marketing of health claims for infant formula than for galactagogue products. The current findings highlight the ubiquitous nature of the artificial breastmilk substitute market and stress the need for increased efforts towards products that may be helpful in initiating and maintaining lactation for persons who may be having difficulty with adequately producing breastmilk.

The high amount of marketing for infant formula, as compared to galactagogue products, is concerning because of its adverse impact on consumer behaviors and breastfeeding rates, morbidity, and mortality (Piwoz and Huffman 2015). Consumers often struggle to discern between health claims that are supported by significant scientific support and those that are not (U.S. Government Accountability Office 2011). This is problematic because many of the marketing claims used by formula companies lack substantial evidence (Belamarich, Bochner, and Racine 2016; Hughes, Landa, and Sharfstein 2017). Regardless, research has shown that caregivers endorse these claims and mistakenly believe these products provide nutrition that is not present in other forms of food such as breastmilk (Romo-Palafox, Pomeranz, and Harris 2020). Unfortunately, subscription to these insubstantial marketing claims have increased the odds of serving infant formula over breastmilk (Romo-Palafox, Pomeranz, and Harris 2020). Conversely, prenatal exposure to breastfeeding information through mass media has shown to have a positive impact on intentions, initiations and intended duration of breastfeeding (Zhang, Carlton, and Fein 2013). To combat the widespread promotion of infant formula, further action needs to be taken to promote breastfeeding through the same channels as formula companies (Kaplan and Graff 2008).

These findings are of particular importance when discussing the significance of breastfeeding in Black communities. In a review conducted by Spencer and Grassley (2013), breastfeeding reduces the incidence of many disease processes that are specific to Black populations while increasing positive health outcomes. Therefore, holding infant formula companies accountable for the marketing that is done in underserved communities such as Black populations is critical primarily when discussing health equity among the most vulnerable (e.g., infants).

Limitations

Though this study adds to an imperative area of study on nutrition and marketing with regards to infant formula, there are some limitations to consider. First, this study was concentrated in the southwest region of the country; hence, these findings cannot be generalized to other areas of the

country. Second, most of the work was done at different retail locations in person; given that we are now in the Digital Age, it may make sense that some of the marketing tactics could be done through media sources, at home mail, pediatricians/obstetrician offices/clinics, and online which could draw to various populations.

Future Directions

Future studies within this area of research should include examining areas across the U.S. with populations that differ with regards to socioeconomic status, race/ethnicity, education, and employment status. Within the past decade, digital marketing of breastmilk substitutes via retail websites, social media, and family/parenting sites have been on the rise (Harris and Pomeranz 2020). With the challenges the COVID-19 pandemic poses to face-to-face business, digital marketing is now more relevant than ever. Hence, future studies should explore the impact of digital marketing on child-bearing populations. The current study uses observational methods and chi-squared tests as its primary method of analyses. Future studies should incorporate more advanced research methodology to study geographical disparities in marketing of breastmilk substitutes including the Gini coefficient, Theil entropy index, and spatial statistical modeling. Given this study focused on urban areas, future studies are encouraged to include rural areas as they are often excluded.

Conclusion

The goal of this study was to explore the disparities in in-store marketing of infant feeding products between stores in Black and White communities. However, the current findings uncovered a widespread inadequacy of breastfeeding promotion, as compared to artificial breastmilk substitutes, in the retail space. The pervasive and unethical marketing of artificial breastmilk substitute continues to undermine efforts to increase breastfeeding rates. With the disproportionately higher risk of suboptimal breastfeeding and infant mortality among Black populations, coupled with affordable, quality lactation counseling/education, paid parental leave, the promotion of safe, quality galactagogue products through marketing for those who desire this type of therapy is vital for significant reduction in Black-White breastfeeding inequities.

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