

Exploring how the COVID-19 Pandemic Impacted Immigrant Breastfeeding
Behaviors Compared to U.S-Born Citizens

by

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ABSTRACT

Immigrants and their U.S.-born children account for 26% of the American population as of 2020. Despite this large proportion, 14% of immigrants live below the federal poverty line compared to 12% of U.S.-born citizens. The immigrant population is vulnerable to food and housing insecurity and limited access to social services and medical care, on top of navigating the increasingly convoluted immigration system. Migrant women and children are especially at risk for systemic, poverty-related adversities. Periods of pregnancy and postpartum are particularly financially straining due to employment disruptions and additional expenses. Migrant mothers experience adverse health outcomes due to chronic stress, unstable living situations, integration barriers, and an unfavorable occupational environment during pregnancy. In addition to the postpartum needs of a new mother and her baby, these challenges may be barriers to maintaining breastfeeding. The unanticipated COVID-19 pandemic exasperated many existing systemic inequities and brought additional hardship. This study aims to investigate breastfeeding rates among immigrant mothers compared to U.S.-born mothers and other social disparities that affect health. While this study did not find a statistical difference between breastfeeding adherence and immigrant status during the COVID-19 pandemic, other risk factors relating to maternal-child health were identified. Immigrant families were more likely to experience job or income loss and a higher frequency of food insecurity compared to families with U.S.-born parents. The risks of being impoverished greatly reduce the incidence of breastfeeding, which can offer tremendous health benefits both to mother and baby. Most immigrants migrating to the U.S. are ethnic minorities who face additional societal disparities in culture, employment,

economic stability, safety, and healthcare. The burden of social determinants of health that impact this population is not unique to adults. The moment a child is born into an immigrant family, particularly if they are also an ethnic minority, they inherit risk factors that can impact their entire lifespan. Ultimately, the risks associated with pregnancy and infant feeding are issues of social justice and health equity.

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INTRODUCTION

Immigrants and their U.S.-born children account for 26% of the American population as of 2020.^{1,2} Despite this large proportion, 14% of immigrants live below the federal poverty line compared to 12% of U.S.-born citizens.^{1,2} The immigrant population is vulnerable to food and housing insecurity and limited access to social services and medical care, on top of navigating the increasingly convoluted immigration system.^{3,4} Migrant women and children are especially at risk for systemic, poverty-related adversities. Periods of pregnancy and postpartum are particularly financially straining due to employment disruptions and additional expenses.³ Migrant mothers experience adverse health outcomes due to chronic stress, unstable living situations, integration barriers, and an unfavorable occupational environment during pregnancy.⁵ In addition to the postpartum needs of a new mother and her baby, these challenges may be barriers to maintaining breastfeeding. The unanticipated COVID-19 pandemic exasperated many existing systemic inequities and brought additional hardship. This study aims to investigate breastfeeding rates among immigrant mothers compared to U.S.-born mothers and other social disparities that affect health.

According to Dr. Ruth Peterson, director of the Center for Disease Control's (CDC) Division of Nutrition, Physical Activity, and Obesity, "Breastfeeding provides unmatched health benefits for babies and mothers. It is the clinical gold standard for infant feeding and nutrition, with breast milk uniquely tailored to meet the health needs of a growing baby. We must do more to create supportive and safe environments for mothers who choose to breastfeed".⁶

The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life until complementary foods are introduced in conjunction with breast milk.⁷ Breastfeeding hosts notable benefits for both the birth-giving parent and the infant.^{6,8} Several barriers prevent families from exclusively breastfeeding infants for the time recommended by the WHO. Recurringly, these challenges are related to low-socioeconomic status, low education levels, and racial demographics.² For low-income families, this time can further increase their risk for food and housing insecurity, and the development of chronic, lifestyle-related disease.³

For immigrants and refugees, the risk is much higher. Certain researchers estimate that half of undocumented immigrants live under the federal poverty line, compared to 30% of documented immigrants and 11% of U.S.-born citizens.¹⁰⁻¹² Parents of lower socioeconomic status are less likely ever to breastfeed than those of higher income and education level.² Marginalized mothers may face disadvantages when accessing reliable breastfeeding support and information, discouraging them from initiating or maintaining breastfeeding.^{13,14}

However, some studies have shown that immigrant mothers are more likely than U.S.-born mothers to initiate and continue breastfeeding up to 12 weeks postpartum.¹⁵ The variation in infant feeding behavior may be impacted by the degree of acculturation or the culture and value of the host country. It has been measured that each year an immigrant parent resides in the U.S., the length of breastfeeding decreases.^{16,17}

When the COVID-19 pandemic hit the United States in early 2020, ethnic minorities and households with children were disproportionately impacted by the

economic fallout of the global emergency.¹⁸ The events of 2020 have proceeded into the following years and may continue to exasperate the existing barriers to breastfeeding among low-income, minority, and immigrant parents.

A 2020 study in the greater Phoenix, Arizona area found that new immigrant and refugee mothers tested positive for COVID-19 at a higher rate than their U.S.-born counterparts.¹⁹ When tested for SARS-CoV-2 by a polymerase chain reaction (PCR) test (collected by nasopharyngeal swab), there was a 17% positivity rate among immigrants and refugees compared to 6% among the general population receiving care at Valleywise Health Medical Center between May 6-June 6, 2020.¹⁹

There is much to be still studied regarding the SARS-CoV-2 virus. Due to physiological and immunological changes in pregnant women, they are at a higher risk for severe cardiopulmonary complications from COVID-19 contraction.²⁰ A recurring fear of new parents is the likelihood of transmitting COVID-19 to their newborn via breastfeeding.²¹ However, the limited available data suggest that transmissible COVID-19 is not present in human breast milk and thus cannot be passed to the infant via the milk of a positive birth-giving parent.²²

The risks of being impoverished greatly reduce the incidence of breastfeeding, which can offer tremendous health benefits both to mother and baby. Most immigrants migrating to the U.S. are ethnic minorities who face additional societal disparities in culture, employment, economic stability, safety, and healthcare. The burden of social determinants of health that impact this population is not unique to adults. The moment a child is born into an immigrant family, particularly if they are also an ethnic minority,

they inherit risk factors that can impact their entire lifespan. Ultimately, the risks associated with pregnancy and infant feeding are issues of social justice and health equity.

LITERATURE REVIEW

COVID & Ethnic Disparities in the U.S.

Disproportionate COVID-19 mortality rates have been measured among vulnerable populations in both the U.S. and the U.K..^{23,24} Ethnic minorities, immigrants, and refugees faced higher rates of infection, hospitalization, and mortality throughout the pandemic.²⁵ Immigrants are overrepresented as essential workers and face lower rates of health insurance.²⁶ The higher infection and mortality rates may also be partially related to a higher likelihood of residing in overcrowded housing, employ precarious forms of work, or occupy in the gig economy.²⁷ In addition, migrants with ambiguous immigration status have been found to postpone seeking medical care until a condition has exasperated due to fears of bureaucratic complications.²⁸

This population has also seen disproportionately higher rates of food insecurity, housing insecurity, and financial disruption.²⁵ The pandemic's subsequent recession leaves the most vulnerable populations at the highest risk of socially determined negative health outcomes.²⁷ The emergence of the COVID-19 pandemic has exacerbated existing health disparities and societal inequities among the immigrant and refugee populations.^{29,30}

Not unique to the COVID-19 pandemic, “othering” of ethnic minorities has long been associated with infectious disease.³¹⁻³³ Immigrants and migrants have been

disproportionately blamed for the emergence and spread of the pandemic and have faced violent and racist attacks as a result.³⁴⁻³⁸ When adding in the complexities and financial strain of being a parent and bringing a new infant into the household further complicates the social and financial strain experienced by these marginalized communities.

Breastfeeding

Breastfeeding is the gold standard for infant nutrition and hosts notable benefits for both the birth-giving parent and the infant.^{39,8} The coenzymes and immunoglobulins found in breast milk provide unmatched support for the infant's developing microbiome. These benefits have been shown to ward off both infectious and chronic diseases as well as aid in emotional and cognitive development.

The WHO recommends exclusive breastfeeding for the first six months of life until complementary foods are introduced in conjunction with breast milk.⁴⁰ Despite global efforts to promote optimal infant feeding practices, it is estimated that only 1 in 4 infants are exclusively breastfed until the 6-month mark.³⁹ The adherence percentage is even lower among low-income families in the U.S..⁴¹

The composition of breastmilk adjusts according to the infant's needs and period of development. Colostrum, the initial milk produced immediately following childbirth, is rich in immunoglobulins necessary for bolstering the immune system and formation of the gastrointestinal microbiota.⁴² As breastfeeding continues and the infant grows, mature milk is developed. Mature milk can be classified into two stages throughout feeding, foremilk and hindmilk. Foremilk is watery and rich in protein and water, suitable for quenching an infant's thirst.⁴² Hindmilk is denser and contains a high concentration of

fat, which is beneficial for neurodevelopment, growth, and vitamin absorption.^{8,42,43} The immune factors present in breast milk, particularly immunoglobulins and human milk oligosaccharides (HMOs) protect against gastrointestinal and respiratory infections.⁴³ Breastfeeding is also associated with a reduced incidence of chronic disease development, such as obesity, diabetes, and asthma.⁴³

Compared to non-breastfeeding mothers, women who breastfeed experience fewer physical and mental postpartum-related illnesses.⁴⁴ Breastfeeding has been found to lower maternal rates of breast and ovarian cancer, diabetes, osteoporosis, cardiovascular diseases, Alzheimer's, and other chronic conditions.⁴⁴ Figure 1 represents both the immediate and long-term benefits of breastfeeding and its positive implications for health.

Figure 1:

Immediate	Long-Term
Uterine involution	Reduced:
Reduced bleeding	Cancer (breast, ovarian, endometrium)
Reduced infection	Endometriosis
Lactational amenorrhea	Diabetes
Reduced adiposity and	Osteoporosis,
weight	Blood Pressure Diseases
Reduced postpartum	Cardiovascular Diseases
depression	Metabolic Syndrome

Reduced stress and anxiety	Rheumatoid arthritis
Improved body image	Alzheimer disease
	Multiple Sclerosis

Inadequate nutrition throughout infancy and childhood can lead to suboptimal health and developmental outcomes, which impact the entire lifespan. The 1000 Days initiative advocates for access of adequate nutrition for birth-giving parents and infants for the first 1000 days of gestation and in-vivo. The range of development from conception to the child's second birthday is a critical period for physical and neurodevelopment.⁴⁵ Combining an adequate prenatal diet, exclusive breastfeeding, and the introduction of nutrient-dense complementary foods at six months of age provides a framework for positive health behaviors that endure through adulthood and prevent the development of chronic disease.^{6-8,45} The 1000 Days Initiative purports that children who receive the proper nutrition through their second birthdays are more likely to be born at a healthy birth weight, have a lower risk of illnesses and diseases, have better learning outcomes with fewer behavioral problems, and experience improved health and economic security in adulthood.⁴⁵

For example, children who are exclusively breastfed for their first six months of life have lower systolic blood pressure than those who are not exclusively breastfed.^{41,46} A healthy systolic blood pressure throughout infancy and childhood can reduce the risk of developing hypertension in adulthood.^{41,46} Breast milk also contains a higher concentration of leptin, a hormone critical for appetite control.^{47,48} Compared to formula-fed infants, breastfeeding infants obtain a physiological advantage in the prevention of

obesity, which increases the risk of developing other comorbid diseases such as type II diabetes, cardiovascular disease, and chronic pulmonary disorders.⁴⁸

Despite global initiatives, the low rates of exclusive breastfeeding indicate that most infants and parents are not receiving breastmilk's short- and long-term benefits. The adherence percentage is estimated to be even lower among low-income families and immigrant parents.^{1,2} Limited access or resources available to acquire food also leads to unhealthy food choices and cessation of breastfeeding.

Figure 2 offers insight into breastfeeding rates throughout the U.S. The low rates of exclusive breastfeeding indicate that most infants and birth-giving parents are not receiving breastmilk's short- and long-term benefits despite global initiatives.⁶ Figure 3 shows roughly half of the infants in the U.S. are being breastfed to the six-month mark recommended by the WHO, and far fewer are exclusively breastfed overall.⁴⁹ The adherence percentage is estimated to be even lower among low-income families and immigrant parents.²

It has been found that mothers have been less likely to breastfeed during the pandemic and fewer than ever are meeting the WHO recommended 6-month mark. An 11% decrease in exclusive breastfeeding and 4% decrease in any breastfeeding was measured during the pandemic.⁵⁰ Lower rates of any breastfeeding was observed in low-income populations compared to more financially secure populations.⁵¹ This may be attributed to additional limitations to accessing social services and reliable lactation support during 2020.

Figure 2:

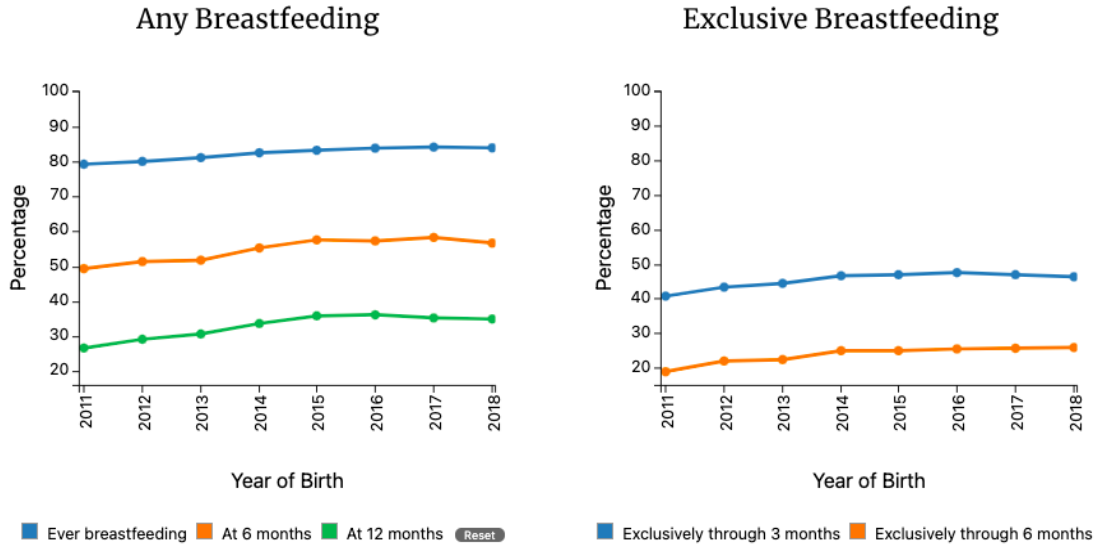
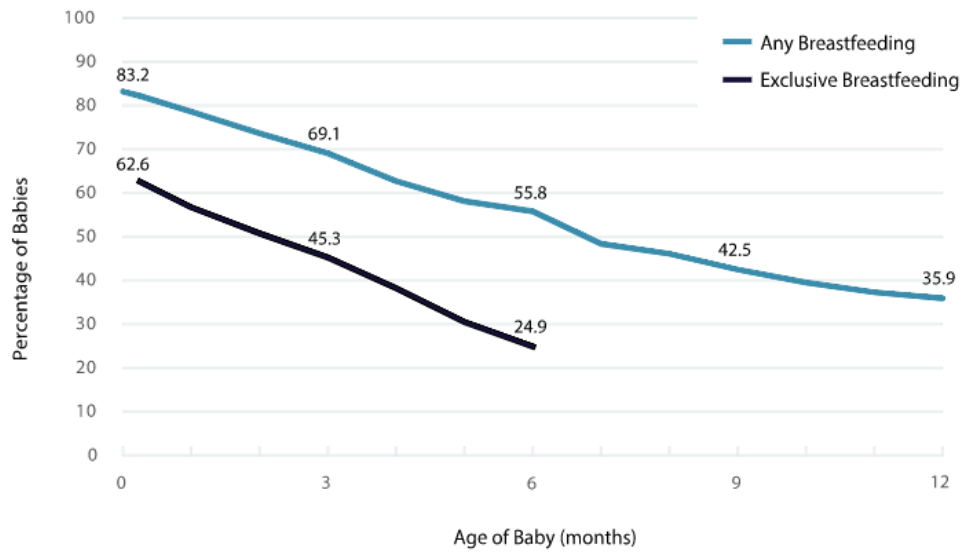


Figure 3



There is much to be still studied regarding the SARS-CoV-2 virus. Due to physiological and immunological changes in pregnant women, they are at a higher risk for severe cardiopulmonary complications from COVID-19 contraction.²⁰ A recurring

fear of new parents is the likelihood of transmitting COVID-19 to their newborn via breastfeeding.²¹ However, the limited available data suggest that transmissible COVID-19 is not present in human breast milk and thus cannot be passed to the infant via the milk of a positive birth-giving parent.²²

Breastfeeding & COVID-19-Immune benefits

At the beginning of the pandemic, it was difficult to assess what the safest method of infant feeding was. There was a concern about the potential clinical outcomes for COVID-positive pregnancies as well as births. While the long-term effects of SARS-CoV-2-positive babies are yet to be determined, it has been concluded that breastfeeding is safe and beneficial upon birth and throughout infancy.⁵² The WHO recommends breastfeeding regardless of a positive SARS-CoV-2 status of either mother or baby.⁵³ Breast milk of infected mothers contains IgA antibodies of SARS-CoV-2, which may offer beneficial immune modulation for infants if exposed to COVID-19 in the future.⁵⁴ The importance of skin-to-skin contact and latching shortly after birth, provides the groundwork for lifelong immunity, nutritional status, and social health.^{52,55} The rewards of breastfeeding influence prolonged mental, physical, and nutritional health, despite the presence of an infection.

Food Insecurity & Breastfeeding

Socioecologically marginalized parents are found to cease breastfeeding sooner than socioecologically privileged populations.¹³ Women and children are recurrently the most at-risk population globally.⁵⁶ Intersectionalities, such as immigrant status, surmount risk. A qualitative cross-sectional study found that mothers concerned with their own

diets are more likely to stop breastfeeding if they perceive their diet as poor due to a lack of access to healthy foods.³ Recurrent data demonstrates that lower-income households purchase less healthy foods because of cost.⁵⁷ The perception of cost-effective food sources typically includes processed foods and sugar-sweetened beverages that are calorically dense and have little nutritional value.⁵⁷ The foods accessible in bodegas, corner stores, or gas stations are less likely to meet a person's nutritional needs, let alone those of a family or developing child.⁵⁸ For low-income households and people living in food deserts, these convenience foods may be all that is feasibly or geographically available, especially through financially and mentally strenuous times like the COVID-19 pandemic.⁵⁸

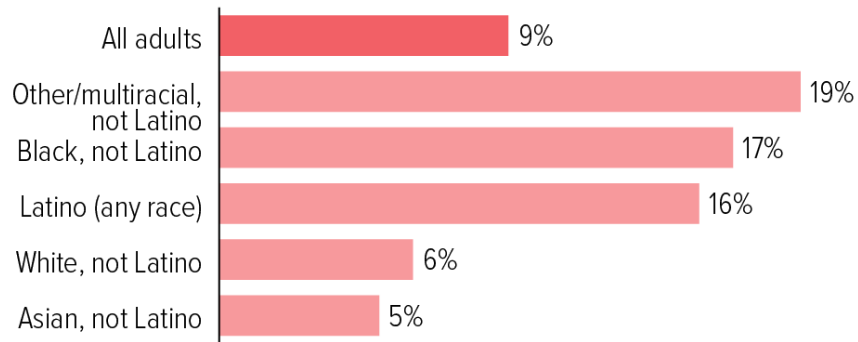
A Canadian study found that financial strain resulting in food insecurity negatively affects the duration of exclusive breastfeeding.⁵⁹ Food insecurity is the lack of consistent access to enough food to maintain a healthy, active life.⁶⁰ As of 2019, 25% of U.S households were considered food insecure.⁶¹ The COVID-19 pandemic increased household food insecurity rates to nearly 1 in 3.⁶¹ Certain populations are more vulnerable to disruptions in their ability to acquire or pay for food. Households with children under the age of 5 years old were found to be the most at risk, with 66% reporting food insecurity.⁶¹ This is particularly troubling because food-insecure children are at least twice as likely to report poor health.⁶² Increased rates of food insecurity were also observed in households that experienced job disruptions throughout the pandemic and primarily amongst minority demographic groups, particularly Black and Latinx families.⁶³

Limitations to food access also result in poor nutrient intake, leading to a higher risk of conditions related to nutrient deficiencies. A significant contributor to food insecurity is a locational deficit of fully stocked grocery stores. Food deserts, defined by the Annie E. Casey Foundation, are geographic areas where residents have few to no convenient options for securing affordable and healthy foods — especially fresh fruits and vegetables.⁶⁴ Food deserts are more commonly found in neighborhoods with a predominant minority population living in poverty.⁶⁵ Low-income families may have inconsistent or limited access to reliable transportation. Aside from the expenses of owning and upkeeping a vehicle, public transportation may not be safe or sufficient for the family’s grocery shopping needs.⁶⁴ The COVID-19 pandemic manifested additional challenges to this already vulnerable population. Disruptions in public transport routes, the supply chain, and imminent infection compounded the existing challenges of acquiring food while residing in a food desert.

Figure 4:

Households of Color Likelier to Lack Sufficient Food During Pandemic

Share of adults saying that their household sometimes or often did not have enough to eat in the last 7 days



Note: Other/multiracial, not Latino = people identifying as American Indian, Alaska Native, Native Hawaiian or Pacific Islander, or more than one race. Percentages are based on reporting distributions and do not include individuals who did not respond to the question.

Source: CBPP analysis of Census Bureau Household Pulse Survey tables for September 29 - October 11, 2021

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COVID-19 Effects on Food Insecurity

The COVID-19 pandemic has exacerbated the challenges of accessing food and practicing breastfeeding. These trends disproportionately impact racial minorities and those living in poverty. The United Nations World Food Program (WFP) predicted a 96% increase in food insecurity throughout 2020, resulting in 265 million people without enough food.⁶⁶ 1 in 3 households in Arizona experienced food insecurity at some point during the pandemic.⁶⁷ Increased rates of Supplemental Nutrition Assistance Program (SNAP) participation were observed amongst Arizona residents.⁶¹ Food assistance participation is highest among households who were food insecure prior to the pandemic at 72%.⁶¹ The use of food pantries increased by 67% during the pandemic throughout the Arizona population, with 17% of respondents reporting being foreign-born.⁶¹ Limited

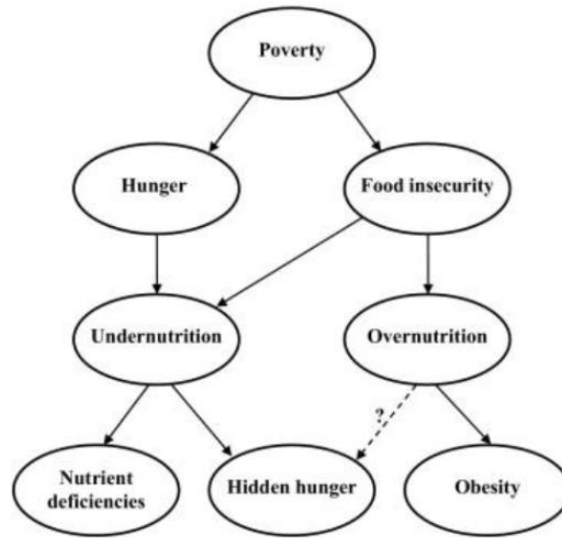
access or resources available to acquire food also leads to unhealthy food choices and cessation of breastfeeding.

Malnutrition

Pediatric undernutrition, as defined by The Academy of Nutrition and Dietetics (ACEND) as well as the American Society for Parenteral and Enteral Nutrition (ASPEN), is: “an imbalance between nutrient requirement and intake, resulting in cumulative deficits of energy, protein or micronutrients that may negatively affect growth, development, and other relevant outcomes.”⁶⁸ Undernutrition increases the risk of infection, hospitalization, and complication of pre-existing conditions.⁶⁹ Furthermore, undernutrition in childhood increases the risk of obesity and comorbid chronic diseases later in life.⁷⁰

Overnutrition is also prevalent among impoverished communities. The obesity-malnutrition paradox exists due to the over-intake of calorically dense foods that are absent of essential nutrients.⁷¹ This leads to a “hidden hunger” that indicates the physiological need for nutrition with a chronic absence of a diet that can adequately meet nutritional needs.⁷¹ Figure 5⁷² demonstrates the progression of poverty to malnutrition and obesity. Obesity and accumulation of central adiposity is an additional risk factors for the development of chronic diseases such as cancer, hypertension, type II diabetes, coronary artery disease, and mental disorders.⁷²

Figure 5:



Progression of poverty to obesity (Tanumihardjo, 2007)

Breastfeeding & Malnutrition Prevention

Breastfeeding can successfully combat infant under and overnutrition. Preventing malnutrition from infancy is critical for growth promotion and long-term health outcomes.⁷³ While maternal nutrition status does impact the micronutrient content of breastmilk, breastfeeding is still recommended independently of poor maternal nutrition.⁷³ The caloric and hydration needs of an infant will be met regardless of the foods the lactating parent consumes.⁶⁸

For food-insecure populations, access to nutrient-dense foods, especially during the sensitive period of pregnancy and infancy, is increasingly challenging. Dietary counseling in the context of breastfeeding promotion or lactation support is a preventative measure against infant and child malnutrition with the potential to prevent chronic disease development throughout life. A primary intervention of this nature can reduce the burden of disease, especially in at-risk communities like ethnic minorities, immigrants and refugees, and those living below the federal poverty level.

Chronic Disease

Mothers who are considered obese (BMI >30) have lower rates of breastfeeding intention and initiation.^{74,75} Early cessation is also more likely than women of a “normal” weight (BMI 20-25).⁷⁵ Women with obesity are also more likely to experience stressful or complicated labor and births, which can delay skin-to-skin contact and early latch.^{74,76} Unintended delayed lactogenesis, or the initiation of lactation > 72 hours post-partum, is also higher among mothers of a higher BMI, which greatly decreases the likelihood of initiating or maintaining breastfeeding.⁷⁴ This perpetuates the cycle of obesity and risk of developing chronic diseases because children who were never breastfed are found to be 22% more likely to be obese than children who were ever breastfed.⁷⁵

Rates of comorbid chronic diseases and poor mental health are higher among immigrant households, which are also more likely to experience poverty and food insecurity.^{73,77} The risk of diabetes development is ~50% higher in food-insecure households.^{73,77,78} Hypertension is present in 22% of adults that grew up in food-insecure households.^{73,77,78} Among immigrant children, there are higher rates of childhood learning disorders, which may contribute to educational and economic deficiencies later in life.⁷⁹ Considering the cyclic nature of poverty, children that grew up food insecure are more likely to be among the population developing chronic diseases. Being a low-income immigrant increases that risk.

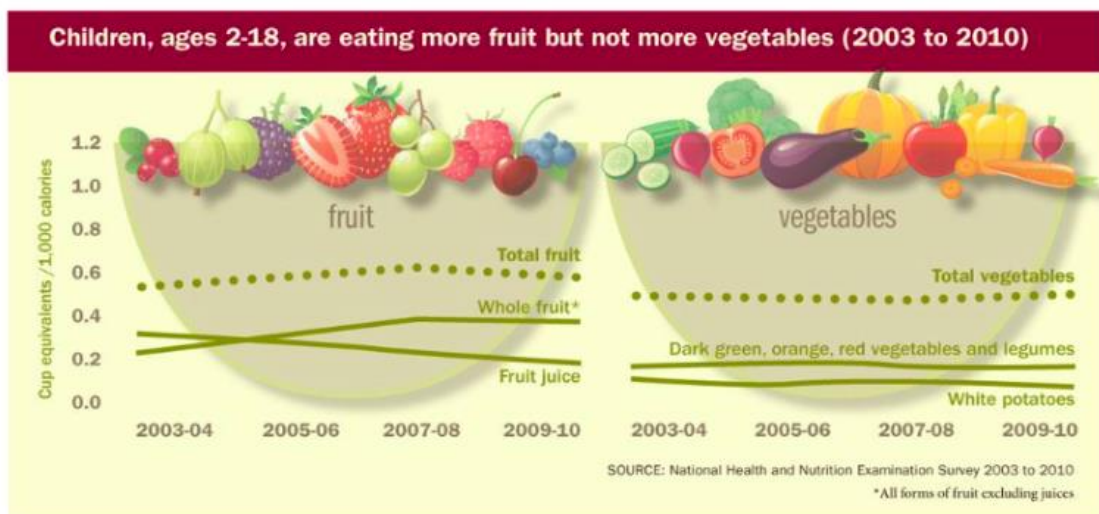
Nutrient Imbalances in Children

Nutrient imbalances can profoundly affect childhood development. A recent CDC study found that 72.1% and 89.7% of children living below the federal poverty level

consume any fruit or vegetables, respectively, on a given day.^{80,81} While these numbers are promising, this does not indicate that they are consuming the recommended amounts of fruits and vegetables per day. It is important to remember that the majority of immigrant families live below the federal poverty line. 25% of children that reside in the U.S. have at least one immigrant parent, making this population particularly susceptible to having a chronically unbalanced diet.^{80,82}

93% of children do not eat enough vegetables to meet the federal dietary pattern recommendations.⁸³ It is necessary to speculate that this percentage has risen since the pandemic due to wide-scale increases in food insecurity. Figure 6 demonstrates that whole fruit consumption has risen while vegetable consumption has largely stayed the same over the past decade.⁸³ Adequate intake of fruits and vegetable wards off micronutrient deficiencies that cause disease and prevent infection or illness.

Figure 6



Fruit & vegetable consumption among children by year (CDC, 2019)

Children residing in low-income homes consume less milk, cheese, fruits, and vegetables.⁸⁴ Serum levels of calcium, vitamin D, and Iron, crucial for building bone health, are consistently low among children.⁷⁰ 19.3% of children and adolescents are considered obese in the U.S.⁸⁵ A substantial cause of the childhood obesity pandemic is the high consumption of sugar-sweetened beverages coupled with low rates of physical activity.⁸⁶ Overweight children are much more likely to become obese adults with chronic illnesses.⁸⁵ Essential nutrient and physical activity deficiencies can lead to chronic illnesses such as coronary heart disease, type II diabetes, stroke, cancer, and osteoporosis. Common nutrients that are under-consumed in children globally are calcium, fiber, folate, iron, magnesium, potassium, and vitamins E and D.⁸⁶

Breastfeeding & Chronic Disease Prevention

A growing body of literature suggests that breastfeeding prevents several chronic diseases such as obesity, hypertension, type II diabetes, cardiovascular disease, chronic respiratory diseases, and cancers.⁸⁷ Breastfeeding also promotes the development of beneficial appetite and satiety cues.⁸⁷ Since infant formula contains a higher fat and protein content, digestion requires increased secretion of Insulin Growth Factor-type 1 (IGF-1), which promotes adipocyte formation.⁸⁸ A physiological predisposition of increased adipocyte development can result in excess weight gain throughout life. Breast milk also contains a higher concentration of leptin, a hormone critical for appetite control.⁸⁷ Compared to formula-fed infants, breastfeeding infants obtain a physiological advantage in the prevention of obesity, which increases the risk of developing other comorbid diseases such as type II diabetes, cardiovascular disease, and chronic pulmonary disorders.⁴⁸

Social Determinants of Health

Disparities in food and nutrition access amongst at-risk populations have a lasting effect on an individual's health, from gestation to geriatrics. The Department of Health and Human Services defines social determinants of health as the environmental conditions in which a person is born, lives, worships, plays, or age that affects their health, functioning, and quality of life.⁸⁹ Immigrants and refugees are at a greater risk of experiencing health disparities due to social-related factors.^{90,91} The traumas associated with migration, such as incarceration, physical violence, or economic distress, can have a substantial effect on their mental and physical health.⁹¹ The stress of leaving one's home country, in conjunction with being met with economic and educational disadvantages, impacts socioeconomic mobility, breastfeeding adherence, and generational health behaviors.

Poverty is a substantial social determinant of health and is more prevalent among ethnic minorities.⁶⁷ Over half of the undocumented immigrants live under the federal poverty line, compared to 30% of documented immigrants and 11% of native-born citizens.¹⁰⁻¹² Poverty puts individuals and families at risk for food and housing insecurity, a substantially stressful and formative experience for children. It is estimated that 51% of children with immigrant parents live below the poverty threshold, which decreases their likelihood of ever being breastfed.^{9,14,92} Food and housing insecurity decrease academic performance rates, mental and physical development, and the ability to generate healthy coping mechanisms.^{79,92} This can lead to perpetuated cycles of poverty, aggression, addiction, and mental illness.⁷⁹

Immigrant populations host an increased risk of negative social determinants of health. They are more likely to experience poor health as a result of hindered economic opportunities, limited qualifications for social services, and sub-par healthcare access.⁸⁴ Over 18 million children live with at least one undocumented immigrant parent in the U.S.⁹³ These children endure stressors and trauma that place them at further risk for poor health outcomes as adults. Difficulties with familial relationships, poverty, food insecurity, housing insecurity, and acculturation impact their development and adult health behaviors.^{84,94} Adults who were children of immigrants or came to the U.S. as children have higher rates of poverty, homelessness, and physical and mental health problems.⁸⁴

Persistent food insecurity throughout childhood has lifelong consequences for mental development and physical health. Household food insecurity is correlated with low educational achievement, low income, and lack of health insurance.⁷⁸ Research indicates that prenatal and childhood food insecurity is associated with an increased incidence of certain birth defects, anemias, asthma, cognitive delays, aggressive behavior, depression, and anxiety.⁷⁹ Food-insecure children are twice as likely to be in fair or poor health.^{95,96}

Immigrant & Refugee Health

The immigrant and refugee population is particularly challenging to gather health behavior data on. Increased immigration enforcement, anti-immigrant rhetoric, and policies targeting immigrants have risen in recent years.⁸² As a result, a widespread notion of wariness has swept across immigrant populations due to fears of government

organizations and deportation.⁹⁷⁻⁹⁹ This leaves them vulnerable to uninsurance, food and housing insecurity, and economic disadvantages.^{82,92,99} Food insecurity rates are estimated to be as high as 38% among immigrant communities, with little to no data regarding housing safety or security.^{100,101} Most of this population is ineligible for federally funded insurance like Medicare and Medicaid, leaving these individuals and families very few options for seeking medical attention or healthcare.⁹¹ Cultural and linguistic barriers may prevent them from enrolling in the few programs they may be eligible for if they are willing to take the perceived risks of their immigration status being disclosed to law enforcement.^{4,10,20}

These trepidations are not unique to undocumented immigrants. Documented immigrants or refugees applying for citizenship also refrain from utilizing government assistance programs, like Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), The Supplemental Nutrition Assistance Program (SNAP), or Temporary Assistance for Needy Families (TANF), due to uncertainties about how it may reflect on their citizenship applications.^{4,82} SNAP, formerly titled Food Stamps, is only available for documented immigrants who have resided in the U.S. for more than five years.^{82,103} WIC is a supplemental nutrition and breastfeeding promotion program available to pregnant individuals and parents of children up to the age of 5. They offer assistance, regardless of immigration status, to parents of a certain income level. Little data is available regarding the percentage of WIC users who are immigrants or refugees. Even fewer data are available on how many eligible parents do not participate due to their immigration status. This already vulnerable population is prevented from seeking the assistance they may need by legal and medical bureaucracy.²⁷

Conclusion

Immigrants and refugees face additional barriers to breastfeeding and providing adequate nutrition for their families. The tribulations of the COVID-19 pandemic increase this burden in addition to the mounting legal and socio-economic challenges they face. Improving universal access to reliable breastfeeding support and social services can better lifelong health outcomes and quality of life for all U.S. residents but particularly at-risk populations such as immigrant and refugee families.

METHODS & DATA COLLECTION

The primary purpose of this study is to investigate the differences between the breastfeeding behaviors of immigrant and refugee mothers versus their U.S.-born counterparts using the data collected from the survey. Specifically, this is a comparison of the impacts that the COVID-19 pandemic has had on breastfeeding behaviors in relationship to the length of time spent living in the U.S. and socioeconomic factors, such as food and job security. The analysis will compare the frequency of pandemic-related hardship between U.S.-born citizens and foreign-born immigrants and, in turn, which group demonstrated less-optimal infant-feeding practices for long-term health and developmental benefit.

Context

The overall investigation is a follow-up to a study published by Johnson-Agbakwu et al. (2021) that identified a significantly disproportionate ratio of refugee mothers testing positive for SARS-CoV2 in the Valleywise Health Medical Center Labor and Delivery ward.¹⁹ There was a 17% positive rate among refugee women when tested

for SARS-CoV-2 by a polymerase chain reaction (PCR) test (collected via nasopharyngeal swab) compared to 8% among the general population receiving care in the labor & delivery unit at VMH Valleywise Health between May 6 and June 6, 2020.¹⁹

In response, an ASU-VHMC team conducted a survey to provide insight into the psychological, social, and behavioral impacts on the perinatal experience during the height of the COVID-19 pandemic. The participants were asked about various topics ranging from general demographic information to their birthing and postpartum experiences through the lens of navigating the pandemic.

Study Design

This study is a quantitative, cross-sectional, exploratory analysis aimed at investigating the social and behavioral impacts the COVID-19 pandemic has had on breastfeeding in high-risk immigrant and refugee mothers that gave birth at the Valleywise Health Medical Center (VHMC)'s Labor and Delivery ward in Phoenix, Arizona.

Participants

Recruitment of women who delivered live infants at VHMC either vaginally or by Caesarian section began in January 2021. Included were births documented after May 1st, 2020, corresponding with the start of universal COVID-19 testing in the VHMC Labor and Delivery Unit.¹⁹ The parent must have been at a minimum of one month postpartum. This timeframe accounted for at least two weeks of pregnancy and one month of postpartum during the pandemic's emergence in Arizona.

The sample included women 18 years or older who were able to provide informed consent. Included was an ethnic cross-section of the patient population of the VHMC's Labor & Delivery unit, with an oversampling of Latina parents and refugees—these two groups were observed to experience higher rates of COVID-19 infection. U.S.-born White and Black women were also included to serve as comparison groups. The sample consists of all patients that meet the inclusion criteria and elected to participate. Of 350 eligible patients, 141 responded to and completed the survey (n=141). ASU IRB approval was granted on November 24th, 2020 (insert study number), and Arizona State University's Watts College provided pilot funding. The survey was a mix of nominal, closed, and open-ended questions. The survey was conducted in six different languages via phone calls. Informed consent was obtained in written or oral form and provided in the appropriate language. Following the reception of the recruitment letter, English and Spanish-speaking participants received a follow-up phone call from an ARA-approved study-team member. Participants were informed that taking part in this survey was voluntary and confidential. Refugee patients were contacted by a Cultural Health Navigator with the recruitment script tailored for phone interactions.

English and Spanish-speaking participants were given the option to complete a written consent via a Qualtrics survey or verbal consent over the phone to be documented by the researcher. All participants received a physical copy of the informational letter and informed consent form. For refugee participants with potentially low technological and written literacy levels, participants provided verbal consent prior to starting the interview. Enumerators again emphasized the voluntary and confidential nature of the study and that

participants may withdraw from the study at any time. The consent form was translated and reviewed by VH Translation Department.

Figures 7 & 8

Inclusion Criteria
<ul style="list-style-type: none">• Women who have delivered a live infant at VHMC beginning in April 2020• At least 1 month postpartum• Aged 18 years or older• Speak English, Spanish, Kinyarwanda, Burmese, or Arabic• Able to give informed consent

Exclusion Criteria
<ul style="list-style-type: none">• Cognitively unable to complete the survey• Prisoners

Funding

Arizona State University's Watts College provided funding for participant incentives and compensation for enumerators.

Recruitment Methods

Following IRB approval, participants who met the inclusion criteria were identified via an Electronic Privacy Information Center (EPIC) patient report of the VHMC Labor & Delivery unit. Patients were then sent the recruitment letter and contacted over the phone by an ARA-certified team member in their native language. Following the reception of the recruitment letter, English and Spanish-speaking participants received a follow-up phone call from a study-team member. Participants were informed that taking part in this survey was voluntary and confidential. A Cultural Health Navigator contacted Refugee patients with the recruitment script tailored for phone interactions.

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Procedures

Following recruitment procedures and informed consent acquisition, Participants were asked to complete the *Psychosocial Maternal Health Survey* via a telephone interview. The interview should take approximately 45 minutes to complete. A separate chart review will be completed by the research team and does not require participant

involvement. Following completion of the survey, participants were sent via mail a \$25 gift card for completing the survey.

Independent Variables

The categorical demographic information that will be used for comparison is country of origin (in or outside of the U.S.). The demographic information will serve as the independent variable to which the other variables will be compared. For the immigrant sample, a continuous variable of time spent residing in the U.S. will allow us to identify if the degree of acculturation has an impact on breastfeeding behavior.

Pandemic-Related Outcomes of Interest (Objective 1)

Economic status is often a predictor of social determinants of health. When the pandemic hit, financial disparities became even more dire and affected the most vulnerable of our population. In this study, I will measure differences between immigrant and U.S.-born experiences of socioeconomically related adversities. The pandemic-related dependent variables I will investigate are experiences of food insecurity, job loss, difficulties paying for necessities, employment status, and occupation as an essential worker due to COVID-19. These observations will show which social group was faced with more sudden changes to their financial situation. Using this data, we can also observe if this had a secondary impact on optimal breastfeeding behavior.

Breastfeeding-Related Outcomes of Interest (Objective 2)

The three dependent behaviors of interest are ever-breastfeeding, breastfeeding cessation, and duration. Ever-breastfeeding indicates any attempt or time spent breastfeeding, regardless of duration or cessation. Breastfeeding duration is the measured length of time the infant was breastfed, regardless of exclusivity. Duration of

breastfeeding is measured in months and recorded via parent recall during the survey. Breastfeeding exclusivity is measured by participant recall of recent infant feeding practices. These factors provide insight into the breastfeeding-related social determinants of health that were impacted during the early stages of the pandemic. Breastfeeding in any form, as discussed above, is an indicator of better life-long health outcomes. Identifying differences between the behaviors of immigrants and U.S.-born citizens highlights any potential disparities that may have been identified or exasperated during the emergence COVID-19 pandemic.

DATA ANALYSIS

In this study, I will assess the relationship between immigration status and infant feeding-related social determinants of health using IBM SPSS statistics software for macOS version 15.1.1. For categorical data, a Pearson Chi-Squared analysis will be performed to assess the association between immigrant or refugee status and other nominal variables, such as ever breastfeeding, the experience of food insecurity, and occupation as an essential worker. Statistical significance will be assessed at ($p \leq 0.05$). In SPSS, a Chi-Squared analysis automatically utilized a Yates correction factor. It is an adjustment in which 0.5 is subtracted from each absolute difference between the observed and expected cell frequencies to ensure significance. Descriptive statistics will also be used to provide comparable data between the sample groups (immigrant or U.S.-born). In responses measured as continuous variables, averages will be utilized for simple data regarding a population group (for example, U.S.-born mothers breastfed for an average of X months). An independent samples t-test or ANOVA will be performed to compare averages between variables depending on how many conditions are being compared.

Levene's independence test is utilized via the t-test to measure equal variances between two groups' means.

RESULTS

Table 1: Ever Breastfeeding & Immigrant Status

Chi-Square Test	Pearson Chi-Square Value	Asymptotic Significance (2-sided) (p-value)
Ever Breastfeeding & Immigrant Status	1.458	0.227

Frequency of Responses	No	Yes	Total	% yes
Immigrant/Refugee	8	104	112	92.86%
U.S. Born	4	24	28	85.71%
Total	12	128	140	85.71%

A chi-square test of independence was performed to evaluate the relationship between immigrant status and ever breastfeeding. Statistical significance was assessed at ($p \leq 0.05$). The relationship between these variables was not significant ($X^2 = [1.458]$, $N = [140]$, $p = [0.227 > 0.05]$). When assessing the frequency of responses, immigrant parents

were more likely to ever breastfeed their babies than U.S.-born parents were, but not significantly so.

Table 2: Length of Breastfeeding & Immigrant Status

Group Statistics:	U.S. born or not	N	Mean	Std. Deviation	Std. Error Mean
Length of BF up to survey date	Immigrant/ Refugee	111	6.0713	10.53807	1.00023
	U.S. Born	26	6.7512	3.67271	0.72028

	Levene's Test for Equality of Variances			Significance			
	F	Sig.	t	Two-Sided p	Mean Difference	Std. Error Difference	
Length of BF up to survey date	Equal variances assumed	0.082	0.775	-0.347	0.729	-0.7274	2.09377
	Equal variances not assumed			-0.593	0.554	-0.7274	1.22623

Table 2 represents the relationship between the length of breastfeeding and immigrant status. Statistical significance was assessed at ($p \leq 0.05$). Using an independent samples t-test and utilizing the Lavene’s test for equality of variances, no significant difference was found between length of breastfeeding and immigrant status (p

=0.729 > 0.05). The average length of time immigrants breastfed before cessation was 6.0713 months and 6.7512 for U.S.-born parents. However, it should be noted that this measure does not consider the exclusivity of breastfeeding.

Table 3: Type of Infant Feeding & Immigrant Status

		BM Only	BM Mostly	Half BM	Some BM	No BM	Other Foods	Total
What did your infant drink this week?	Immigrant/Refugee	24 (23%)	33 (31%)	15 (14%)	10 (10%)	20 (19%)	2 (2%)	104
	U.S. Born	4 (18%)	9 (41%)	1 (5%)	0 (0%)	3 (14%)	5 (23%)	22
	Total	28	42	16	10	23	7	126

Chi-Square Tests (by immigrant status)	Pearson Chi-Square Value	Asymptotic Significance (2-sided)
Type of Infant Feeding	18.624	0.002
Breastmilk Only	0.252	0.616
No Breastmilk	0.381	0.537

Table 3 considers the type of infant feeding that took place (BM = breastmilk). Statistical significance was assessed at ($p \leq 0.05$). Using a crosstabulation and chi-square test, it was determined that there was a significant difference between the type of infant feeding practices utilized by each population ($X^2 = [18.642]$, $N = [126]$, $p = [0.002 < 0.05]$).

It was also found that a slightly greater proportion of immigrants exclusively breastfed than U.S.-born parents (23% vs 18%). However, when assessing for significance, no difference was observed ($X^2 = [0.252]$, $N = [126]$, $p = [0.616 > 0.05]$). The same was found when assessing if one group did not feed the infant any breastmilk ($X^2 = [0.381]$, $N = [126]$, $p = [0.537 > 0.05]$). Ultimately, no relationship was found between immigrant status and exclusive breastfeeding for six months.

Table 4: Infants >/6 Months Old, Exclusive Breastfeeding, & Immigrant Status

Infants >/6 Months Old: What did your infant drink this week_BM only		No	Yes	Total
U.S. born or not	Immigrant/ Refugee	21	13	34
	U.S. Born	2	3	5
	Total	23	16	39

	Value	Asymptotic Significance (2-sided)
Pearson Chi-Square	.853	.356

Table 4 shows the frequency and chi-square analysis of exclusive breastfeeding for infants less than (or equal to) six months of age at the time of the survey. Statistical significance was assessed at ($p \leq 0.05$). When compared to infants from U.S.-born parents, there was no significant difference between rates of exclusive breastfeeding in the immigrant group ($X^2 = [0.853]$, $N = [39]$, $p = [0.356 > 0.05]$).

Table 5: Chi-Square Analysis of Income-Related Variables by Immigrant Status

Chi-Square Test (by immigrant status)	Pearson Chi-Square Value	Asymptotic Significance (2-sided) (p-value)
Occupation as an essential worker	1.842	0.175
Job/Income Loss	10.924	0.004
Difficulty paying for necessities	1.988	0.37

Table 5 is a collection of income-related dependent variables. Statistical significance was assessed at ($p \leq 0.05$). Amongst this data set, there was no observed difference between occupation as an essential worker or difficulty paying for necessities and immigrant status. However, significantly more immigrant parents reported job loss compared to U.S.-born parents ($X^2 = [10.924]$, $N = [140]$, $p = [0.004 < 0.05]$).

Table 6: Employment Status and Length of Breastfeeding

Bayesian ANOVA	Parameter	Posterior	Variance	95% Credible Interval	
		Mean (months)		Lower Bound	Upper Bound
	Full-Time Care Provider	5.37	1.185	3.233	7.507
	Unemployed, Not Seeking Work	6.045	8.62	0.282	11.809

Unemployed, Seeking Work	7.25	11.853	0.492	14.008
Employed Full-Time	6.956	3.387	3.344	10.569
Employed, Part-Time	7.417	7.902	1.899	12.935

Table 6 assesses if occupation status had an impact on breastfeeding length, regardless of immigrant status. As Table 5 confirmed, more immigrants faced job loss during the pandemic. When assessing the length of time, part-time employees reported the longest average time spent breastfeeding their infants. Full-time care providers (stay-at-home-parents) reported the shortest amount of time breastfeeding, with an average of 5.37 months. These results indicate that job status & amount time spent working, did not play a significant role in the length of time spent breastfeeding in this sample.

Table 7: Food Insecurity & Immigrant Status

Food Insecurity & Immigrant Status		Asymptotic Significance (2-sided)		
		Pearson Chi-Square Value		(p-value)
		23.602	<.001	
Observed vs. Expected Counts		Rarely or Never	Usually or Always	Total
Immigrant/ Refugee	Observed Count	7	105	112

	Expected Count	5.7	106.3	112
U.S. Born	Observed Count	0	26	26
	Expected Count	1.3	24.7	26
Total	Observed Count	7	131	138
	Expected Count	7	131	138

A chi-square test of independence was performed to evaluate the relationship between Food Insecurity and Immigrant Status. Statistical significance was assessed at ($p \leq 0.05$). The relationship between these variables was found to be significant ($X^2 = [23.602]$, $N = [138]$, $p = [<0.001 < 0.05]$). Immigrants were significantly more likely to experience food insecurity than U.S.-born parents during the COVID-19 pandemic. It should be noted that the survey questions regarding food insecurity are not from a validated screener but pulls from a USDA surveying tool.

Table 8: Food Insecurity & Breastfeeding for Six Months

Food Insecurity & BF >/6 months	Value	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.354	.113

Finally, the relationship between food insecurity and breastfeeding for more than six months was determined via a chi-square test. Statistical significance was assessed at ($p \leq 0.05$). No statistical significance was found between these variables ($X^2 = [4.345]$, $N = [140]$, $p = [0.113 > 0.05]$).

DISCUSSION

The findings of this study offer a very compelling outlook on infant feeding during the COVID-19 pandemic. The most statistical differences observed between immigrant and U.S.-born parents related to job loss and food insecurity. More immigrants faced income-related challenges during the pandemic. As discussed in the rest of the document, poverty and financial insecurity are predispositions to long-term physical and mental health inequities. These findings further strengthen the need for additional safety nets for marginalized communities, such as ethnic minorities, immigrants, and refugees.

Broader research on COVID-19, breastfeeding, and immigrants has focused on understanding the prevalence and impact of the virus on these populations, as well as identifying potential interventions to reduce the spread of the virus and protect vulnerable individuals. Some studies have found that breastfeeding may help protect infants from COVID-19, while others have highlighted the need for targeted public health campaigns and culturally sensitive communication strategies to reach immigrant populations.

Of the literature published regarding the impacts of COVID-19 on maternal child health, most papers have not conjoined a clinical and social outlook. I intentionally wanted to capture the intersection of health outcomes and social and bureaucratic influences on immigrants and their infants. The facts regarding financial and legal

insecurity are as well documented as the health benefits of a lifelong nutritious diet, including breastfeeding throughout infancy and early childhood. Just like all scopes of health practice, it is important to assess an individual's entire being in order to promote health and wellness appropriately. Considering the inequitable needs of ethnic minorities, the impoverished, and immigrants enables practitioners and community workers to serve this population optimally.

When interpreting these results, it is important to consider the context of the study to understand the scope and applicability of the findings. A study involving immigrant parents may face several limitations, which can impact the generalizability and validity of the findings. Studies of this nature may suffer from sampling bias. It may be challenging to obtain a representative sample of immigrant parents, given that they are a heterogeneous group and may have different levels of acculturation, language proficiency, and socioeconomic status. This can lead to a biased sample, which may not accurately represent the population of immigrant parents. Language barriers can also pose a significant challenge in studies involving immigrant parents. Many immigrants may not be proficient in the language of the host country, which can limit their ability to participate in the study or understand the questions. This can lead to inaccurate responses and biased results.

Immigrants come from different cultural backgrounds, which can affect their attitudes, beliefs, and behaviors. These cultural differences can make it challenging to develop questions that are appropriate and relevant for all participants. Additionally, cultural differences can lead to differences in response styles, which can affect the validity of the results. Access to a diverse pool of immigrant and refugee parents can be

difficult, particularly if they are undocumented or have limited social networks. This can limit the sample size and may affect the generalizability of the findings.

Bias can be introduced into the study through the data collection process. Interviewers or researchers may have biases or preconceived notions, which can affect the way they ask questions or interpret responses. Additionally, immigrants may be reluctant to provide information about sensitive topics, such as their financial situation, legal status, or experiences of discrimination.

Studies involving immigrant parents require careful consideration of these limitations to ensure that the findings are valid and generalizable. Researchers must consider strategies to address these limitations, such as developing culturally appropriate measures and recruiting a diverse sample of participants.

If I were to conduct this survey again, there are a few questions I would add and some I would ask differently. These questions primarily would focus on the parent's participation in community resources and income. Insight into whether the respondents were participating in SNAP or WIC provides information on nutrition assistance and a potentially incongruent perception of food insecurity. WIC participation would also provide information on access to breastfeeding support and promotion. These findings would also inadvertently demonstrate income level and poverty incidence based on the eligibility criteria of both programs.

The null findings relating to breastfeeding inequities may be attributed to a robust community outreach program through Valleywise Health Medical Center (VHMC), uniquely available to immigrants and refugees. The VHMC offer a wide range of services to patients, including lactation support, nutrition counseling, and women's health clinics,

and there are community health coordinators to connect patients to the resources they express a need for.¹⁰⁴ These findings demonstrate the beneficial impact an accessible, integrated approach to healthcare can make. For example, a patient connected with a community health coordinator may be more likely to be enrolled in WIC throughout pregnancy and postpartum, making them less vulnerable to food insecurity. These resources would be provided regardless of immigration or documentation status as a result of the efforts made by their care team. This can break the cycle of poverty, improve the duration and exclusivity of breastfeeding, and reduce the lifelong risk of chronic disease development.

Connection to social services or community resources may also be a contributing factor to why more parents did not report difficulty paying for necessities or food insecurity. Despite job loss and other financial insecurity, social services that provided resources for families may have eased these worries. It is important to bear in mind that everyone's definition of hardship is different, and the extent of help an individual receives may impact their situation and outlook in different ways.

Another valuable consideration of these findings is the point in time this survey took place. While the 2020 pandemic brought unique challenges to employment, socialization, and medical care, it also brought a unique opportunity for staying home. A new parent may have been able to take that time to bond with their infant and troubleshoot breastfeeding without the added stressors of returning to work, regardless of parental leave allotments. This could also mean more family members were around to provide the mother with lactation and social support.

Keep in mind the pandemic has existed in many different waves. The COVID-19 pandemic we live with today is very different from the frightening novelty of 2020. In the past few years, we have lived through political discord, skyrocketed inflation, infant formula shortages, supply chain disruptions, exorbitant gas and grocery prices, and the cost of housing at an all-time high. It would have been interesting to follow the participants throughout different stages of the pandemic to assess any changes to their coping strategies, infant feeding practices, childcare availability, and income-related situation. A prospective study would have been able to measure some of the prolonged hardships that have arisen as COVID-19 has continued to play a role in our day-to-day lives.

Globally, immigration is a complex and nuanced legal debate. There are over 45 million immigrants residing in the U.S..¹⁰⁵ The census bureau estimates that this number will grow to 65 million by 2050.¹⁰⁶ A major driving factor for migration will be the progression of the climate crisis. Natural disasters, food supply disruptions, and geopolitical shifts all contribute to migration and the exasperation of refuge-seeking. As these matters are tackled on a global stage, offering safeguards for long-term health will become even more dire in these vulnerable populations. It will be increasingly important that the healthcare field is prepared to address the needs and disparities in nutritional security. Regardless of the statistical findings of this study, breastfeeding support, and promotion needs to continue to be a priority worldwide, especially in uncertain times like a pandemic.

Overall, I think these findings offer valuable insights into the larger conversation of Maternal Child Health and the inequities faced by socially disparaged communities.

Breastfeeding has a huge impact on long-term health. It is reassuring to see no statistical difference between immigrant and U.S.-born infant feeding practices and that both groups are roughly meeting six months of breastfeeding, independent of exclusivity. The recent economic challenges (particularly formula shortages) may have turned the tide to emphasize breastfeeding initiation and continuation further. It is more important than ever to promote integrative support to marginalized mothers and families to increase rates of exclusive breastfeeding across the country and around the world.

CONCLUSION

According to my findings, there was not a significant difference between immigrant and refugee breastfeeding behavior in comparison to U.S.-born parents during the COVID-19 pandemic. However, significant financial disruption and food insecurity was measured among immigrant parents. Despite prior evidence of poverty negatively impacting breastfeeding initiation and duration, the participants of this study did not exhibit such subjugation.

The results regarding breastfeeding are reassuring. It is evident that the participants received education and support regarding breastfeeding and its benefits. It is important that all parents are able to have their questions answered and concerns are addressed throughout pregnancy and postpartum. Better-supported communities lead to healthier behaviors and better health outcomes. Especially in uncertain social, political, and economic times, it is pertinent that all families have access to adequate, appropriate, and integrated resources to take care of their children better. Breastfeeding and lactation support offer that support from day one of that person's life.

The disproportionate experience of food insecurity among the group of immigrant parents further supports the literature on inequities faced by ethnic minorities and other disenfranchised communities. Food and nutrition being the foundation of health, these findings reinforce the need for comprehensive nutrition support regardless of immigration status. The system in which individuals and families are approved for social services should be streamlined to support our most vulnerable residents rather than utilize exclusionary practices.

As discussed before, childhood food insecurity and malnutrition cascade into a predisposition to chronic and mental illness. We need a society in which we are all given the resources and support to be adequately nurtured from birth. Programs like WIC do an excellent job of assisting parents, caregivers, infants, and children. They ensure that they are provided with reliable information, nutrition support, and lactation support and are connected with community services that they express a need for, regardless of immigration or documentation status. Expanding migrant access to social services like SNAP, TANF, and Medicare is an impactful way to work toward health equity and minimize negative social determinants of health.

Studying maternal child health provides valuable insight into the future of our country's health. It is paramount that marginalized dyads are included as well; those with disabilities, those of diverse ethnic backgrounds, and those who are not native to these lands. Ensuring all voices are included in the conversation of bolstering our medical field and society results in a more robust response to future emergencies.

POSITIONALITY STATEMENT

Being the child of an immigrant, I have a lot to say regarding health equity and the convoluted immigration system in the U.S. My brother and I grew up with an undying fear of my father's deportation and legal persecution. It wasn't until adulthood that I could fully identify all of the sacrifices my parents made to keep us safe and our family together. The challenges that come along with fighting an immigration battle are extremely emotionally and financially damaging. I have stared down the barrel of ICE agents' rifles. I have lived the experience of intermittent food and housing insecurity. I have wiped away the tears from my parent's eyes. I have felt fear, anger, and frustration as a side effect of the disenfranchisement of being an immigrant in the U.S. I am pained every time I hear racist, ignorant comments about migrants taking advantage of the system when in reality, immigrants are indentured to a government and public that has thrust us into the shadows while bolstering society on our shoulders. Without immigrants, our food systems would collapse, our supply chains would break, our businesses would close, and our neighbors would vanish.

Every day that I have spent working on this thesis has served as a reminder of how far my family and I have come. I feel immensely privileged to have haled from shallow roots and fertilize my family tree with every word I have written. I will have taken them with me in every step I take until I cross that final stage at graduation. I write this for every uphill battle an immigrant family faces. I write this for every mother, father, elder, infant, and child that has been dealt the hand of bureaucracy and stands to fight another day. May this graduate thesis act as living proof of the triumphs that come

from sacrifice, heartache, trauma, and perseverance. It is past time to care for our melting pot and all people that fill it.

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APPENDIX A

SURVEY TOOLS:
PSYCHOSOCIAL MATERNAL HEALTH SURVEY

Perinatal outcomes and psychosocial health during the COVID-19 pandemic

Blue highlight - notes for interviewer / training

Pink Highlight – Question numbers (not for translation, please keep as is)

Interview Information. *[For interviewer to complete]*

mrn. Participant MRN: _____

lang. Language of interview: _____

intv. Interviewer initials: ____

date. Date: __ __ / __ __ / __ __ __ __ (month / date / year)

DEMOGRAPHICS

First, I'm going to ask you questions about your background.

sd2. In what country were you born?

sd5. What year did you arrive in the United States?

sd13. What month did you give birth to your youngest child?

sd15. What is your current employment status? (Are you currently working?) *[Don't read options, probe if necessary to clarify the best response, and use "other" if necessary]*

- Full-time care provider ("stay-at-home mom")
- Unemployed, not seeking work
- Unemployed, seeking work
- Employed full-time
- Employed part-time
- Other: _____

sd16. How old was your infant when you returned to work, or how old will your infant be when you plan to return to work?

- ____ months
- ____ weeks
- No plans to return to work
- Not applicable (not working)
- Don't know

INFANT FEEDING

Now I'm going to ask you questions about breastfeeding during COVID-19.

if1. Think back to your pregnancy. How did you plan to feed your baby?

- Breastmilk from the breast
- Breastmilk from a bottle
- Formula from a bottle

- Other: _____

if3. Did you ever breastfeed your baby?

- Yes
- No, I never breastfed

if4. Have you stopped breastfeeding?

- No
- Yes

if4a. When? When the infant was:

- ___ months old
- ___ weeks old
- Other: _____

Now I'm going to ask you questions about challenges with breastfeeding, or feeding milk from your breast, for your youngest baby during the COVID-19 pandemic.

if9. Did you experience other challenges in breastfeeding related to the pandemic?

- Yes
- No

Now I'm going to ask you questions about the support you received related to breastfeeding.

if11. How much help around the house makes it easier to breastfeed, such as help with laundry, preparing meals, and other tasks? **[Read response options to participants]**

- No help at all
- Less than you would like
- As much as you would like

if12. How much emotional support have you received that makes it easier to breastfeed, such as others making you feel confident even when making mistakes, believing you are a good mother, and showing concern for your health, both your body and when you feel sad? **[Read response options to participants]**

- No support at all
- Less than you would like
- As much as you would like

if13. How much informational support have you received that makes it easier to breastfeed, such as suggesting where to get help breastfeeding, answers to breastfeeding questions, and teaching you how to take care of yourself? **[Read response options to participants]**

- No support at all
- Less than you would like

- As much as you would like

if14. Has COVID-19 changed how you breastfeed your infant? Please explain your response

- Yes. _____
- No. _____

if15. Thinking about this past week, what did your infant drink? *[Don't read options, probe as necessary to clarify, use "other" as necessary]*

- Breastmilk
 - Breast milk only, no other liquids (formula, water, juice)
 - Mostly breast milk, some other liquids
 - About half breast milk, some other liquids
 - Some breast milk, but mostly other liquids
- No breast milk
- Other foods (*Probe: what kind?*) _____
-

FOOD SECURITY

Now I'm going to ask you some questions about your food situation.

fi1. Which of these two statements best describes your household food situation in the past month?

- We usually or always have the kinds of food that we want
- We rarely or never have the kinds of food that we want

fi2. Which of these two statements best describes your household food situation in the past month?

- We usually or always have enough food
- We rarely or never have enough food

STRESS

Now I'm going to ask you questions about challenges during the COVID-19 pandemic.

During the COVID-19 pandemic (since March 2020), have you...

stress1. Had difficulties paying for basic necessities?

- Yes
- No
- Not applicable

stress2. Lost your job or your main source of income?

stress7. Worked in a high-risk environment as an "essential" worker (e.g., healthcare, grocery store, sanitation, delivery person, childcare, etc.)