DETERMINANTS OF BREASTFEEDING PRACTICES: EMPIRICAL EVIDENCE FROM TURKEY

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

CANSU OYMAK

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
THE DEPARTMENT OF SOCIAL POLICY

JULY 2021

Approval of the thesis:

DETERMINANTS OF BREASTFEEDING PRACTICES: EMPIRICAL EVIDENCE FROM TURKEY

submitted by **CANSU OYMAK** in partial fulfillment of the requirements for the degree of **Master of Science in Social Policy, the Graduate School of Social Sciences of Middle East Technical University** by,

Prof. Dr. Yaşar KONDAKÇI
Dean
Graduate School of Social Sciences _____

Assoc. Prof. Dr. Ayşe İdil AYBARS
Head of Department
Department of Social Policy _____

Prof. Dr. Meltem DAYIOĞLU TAYFUR
Supervisor
Department of Economics _____

Examining Committee Members:

Prof. Dr. Dürdane Şirin SARAÇOĞLU (Head of the Examining Committee)
Middle East Technical University
Department of Economics _____

Prof. Dr. Meltem DAYIOĞLU TAYFUR (Supervisor)
Middle East Technical University
Department of Economics _____

Prof. Dr. Jülide YILDIRIM ÖCAL
Middle East Technical University
Department of Economics _____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last Name: Cansu OYMAK

Signature:

ABSTRACT

DETERMINANTS OF BREASTFEEDING PRACTICES: EMPIRICAL EVIDENCE FROM TURKEY

OYMAK, Cansu
M.S., The Department of Social Policy
Supervisor: Prof. Dr. Meltem DAYIOĞLU TAYFUR

July 2021, 148 pages

The medical literature is full of evidence showing the unmatched health benefits of breastfeeding for the children under five years of age. However, little is known about its determinants for the Turkish context because of the absence of research providing findings at national level. To that extent, we utilize a representative dataset for the Turkish population to explore the determinants of breastfeeding practices as measured by the exclusive breastfeeding and duration of breastfeeding. To quantify their correlates, we use Ordinary Least Squares (OLS), Linear Probability Model(s), and Cox Regression Models. Our estimation results show that the longer duration of breastfeeding is associated with being a male, having (older) siblings, having (older) brothers, and living in Poorer, Rich, and the Richest households. To begin with, higher prevalence of the exclusive breastfeeding is related to residing in urban areas, having a less-educated mother, living in a less-crowded household, and living in South and East.

Keywords: Breastfeeding Duration, Exclusive Breastfeeding, Gender Discrimination, Rural/Urban Gap, Cox Regression.

ÖZ

EMZİRME UYGULAMALARININ BELİRLEYİCİLERİ: TÜRKİYE'DEN AMPİRİK KANIT

OYMAK, Cansu
Yüksek Lisans, Sosyal Politika Bölümü
Tez Yöneticisi: Prof. Dr. Meltem DAYIOĞLU TAYFUR

Temmuz 2021, 148 sayfa

Tıp literatürü emzirmenin beş yaşın altındaki çocuklar için eşsiz sağlık faydalarını gösteren kanıtlarla doludur. Ancak, ülke düzeyinde bulgular sağlayan araştırmaların olmaması nedeniyle Türkiye bağlamında bu belirleyicileri hakkında çok az şey bilinmektedir. Bu kapsamda, yaşamın ilk altı ayında sadece anne sütü ile beslenme durumu ve emzirme süresi ile ölçülen "emzirme uygulamalarının" belirleyicilerini araştırmak için Türk nüfusu temsil eden bir veri seti kullanıyoruz. Söz konusu ilişkilerini ölçmek için Sıradan En Küçük Kareler (OLS), Doğrusal Olasılık Modelleri (LPM) ve Cox Regresyon Modellerinden yararlanıyoruz. Tahmin sonuçlarımız daha uzun emzirme süresinin erkek olmakla, (daha büyük) kardeşlere sahip olmakla, (büyük) erkek kardeşlere sahip olmakla ve zengin hanelerde yaşamakla ilişkili olduğunu göstermektedir. Bununla birlikte, yalnızca anne sütüyle beslemenin daha yüksek yaygınlığı, kentsel alanlarda ikamet etmek, daha az eğitimli bir anneye sahip olmak, daha az kalabalık bir evde yaşamak ve Güney'de ve Doğu'da ikamet etmekle ilgilidir.

Anahtar Kelimeler: Emzirme Süresi, Yalnızca Anne Sütü ile Beslenme, Cinsiyet Ayrımcılığı, Kırsal/Kentsel Farkı, Cox Regresyon.

To Beloved Sister

ACKNOWLEDGMENTS

First, I would like to thank my advisor, Prof. Dr. Meltem Dayıoğlu Tayfur, for her continuous guidance and support throughout my research. Without her patience and understanding, I would not have had the perseverance to complete this thesis.

Besides my advisor, I am grateful to my committee members, Prof. Dr. D. Şirin Saraçoğlu and Prof. Dr. Jülide Yıldırım Öcal, for their precious feedback and comments on my thesis. Their guidance and recommendations will undoubtedly help me in future research.

Words are not enough to express my gratitude for Prof. Dr. Aysıt Tansel and Assoc. Prof. Tekin Köse. I truly acknowledge that I owe a lot to them. I am also grateful to Assoc. Prof. Mehmet Ali Eryurt for his contribution to the data collection process. My sincere thanks also go to Dr. Vincent O'Sullivan, Prof. Bruce Hollingsworth, and Dr. Stephen Kastoryano, for believing in me.

It was impossible for me to complete this process without emotional endorsement from my dearest friends Ceren Koşak, Rena Ergüneş, Meltem Baştan, Hazal Güzel, Tilbe Gökalp, Neşe Özdemir, Nihal Yıldız, Ayşenur Ahsen, Cansu Türk, Can Demir, and Kübra Avcıoğlu. They were always present during my darkest times and made me believe that I am capable of achieving this. The last and perhaps the most significant efforts placed on me belong to my family members. I am the luckiest person because I was born as a daughter of Meltem Oymak and Okan Oymak.

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Maternal breast milk is the healthiest and biologically the ideal way of nurturing human infants as well as being costless. Compared to its substitutes (e.g., the baby/infant formula), breast milk has unrivaled health benefits for both mothers and their offspring. In fact, it is regarded as the mothers' first and the most precious gift to the newborns (Hanson and Söderström, 1981). Breast milk contains several antibodies such as IgA, IgM, and IgG, each of which are known as "immunoglobulins" in the medical literature. The presence of such immunity-booster antibodies in the infants' circulatory system is of paramount importance because they act like a preserver by forming a coat on their ear, nose, throat, and intestine. In turn, they protect the newborns against various ill-health conditions as well as neonatal death, which usually occurs within 28 days following the labor. These include, but not limited to, significantly reduced risks of phthisic, overweight, obesity, type-I diabetes, virus- or bacteria-led upper/lower respiratory illnesses, acute otitis media, sudden infant death syndrome, diarrhea, gastrointestinal inflammation, and a few contagious diseases (Centers for Disease Control and Prevention (CDC), 2020; Alshammari and Haridi, 2021). Given its nutritional and immunological benefits, the maternal breast milk has been proved to save almost 900,000 children's lives -on a yearly basis- who are under five years of age (Victora et al., 2016). In fact, its life-saving feature is not restricted to neonatal stage of life, but rather last until early childhood period. In addition to its positive contribution to the survival rates, one of the long-lasting benefits of the breast milk consumption is its impacts on neural, cognitive, and behavioral functioning. Even though some portion of the cognitive and behavioral development is explained by heredity (or genetic transmission), the role of breast milk in the intellectual competence of children (as measured by using a standardized test for cognitive ability) is previously shown to be significant – even

after controlling for the mothers' educational attainment (Bartels et al., 2009; Lee et al., 2016). On the other hand, there is a growing volume of evidence showing that the providers of breast milk (i.e., the mothers) take advantage of breastfeeding in several ways. For instance, the event of breastfeeding decreases the likelihood of ovarian/breast cancer and osteoporosis (World Health Organization (WHO), 2020). The maternal benefits of breastfeeding are not limited to its disease-preventing feature. Instead, it induces a stimulation in the uterus which in turn aids returning its actual size promptly, and an acceleration in weight loss by burning extra calories on a daily basis (i.e., an extra of 500 calories per day, on average) (CDC, 2018). In addition to its physiological benefits, its influence on the post-partum depression (which is highly likely to cause the early termination of breastfeeding) is non-negligible (Pope and Mazmanian, 2016).

Nevertheless, one should keep in mind that the (mutual) health benefits of breastfeeding are intimately connected with its initiation, exclusivity, and duration. According to the WHO and UNICEF (2020), the mothers should start breastfeeding immediately after delivery takes place, provide an uninterrupted exclusive breastfeeding for the first six month of life, and continue to nurse (with an appropriate complementary diet) until their offspring turn the age of 2 or beyond. Hence, the maximum gains through breastfeeding can only be obtained by following the universal recommendations. The maximum gains from breastfeeding deserve a particular attention because of the following reason. They are not only related to the reduced costs of healthcare utilization or the prevention of myriad of diseases, but also linked with building the human capital that is going to run their economies in the long-term. To that extent, Der et al. (2006) places an emphasis on the fact that the exclusivity and duration of breastfeeding are powerful correlates of hitting greater scores on the Intelligence Quotient (IQ) and aptitude tests. That is, breastfeeding may constitute an indirect -but powerful- pathway of reaching sustainable economic growth through its effects on the academic performance, which causes higher earning potential, and increased productivity. In fact, the WHO (2017) suggests that countries lose approximately 300 billion U.S. dollars annually due to the low rates of nursing – corresponding

to 0.48 percent of Gross National Income. Therefore, any campaign and/or policy aiming to improve the breastfeeding practices is highly likely to contribute to the human capital accumulation and thus to macroeconomic indicators.

To increase the breastfeeding rates throughout the world, the UNICEF and WHO jointly release "The Global Breastfeeding Collective" (UNICEF, 2018). It has seven main components to enable mothers to nurse their offspring. The first one includes the provision of funding. According to the World Bank estimations, if countries provide an average of $5 per baby, it will guarantee hitting the World Health Assembly's (WHA) target of achieving 50.0% exclusive breastfeeding in the first six months of life by 2025. The second one aims to curb the inappropriate marketing of breast milk substitutes (i.e., the baby formula) in the media channels that deludes the mothers about how to feed their newborns accurately. The provision of maternal benefits (e.g., nursing rooms at workplaces and paid parental leave for at least 18 weeks) at the business places is the third concern of this collective. The rest includes the following items: increasing the number of Baby-Friendly Hospitals, the encouragement of community networks where mothers can interact with each other, the provision of counselling services, and the establishment of government-led tracking system to observe the breastfeeding trends. Nonetheless, the World Bank estimates show that some low- and middle-income countries have already reached the WHA's target of at least 50.0% of exclusive breastfeeding (World Bank, 2018). It is found to be 87.0% in Rwanda, 69.0% in Peru, 66.0% in Uganda, 65.0% in Cambodia, and 55.0% in India. In addition to this, the mean duration of breastfeeding for children below age 3 is found to be 27.2 months in Rwanda (Rwanda Demographic and Health Survey, 2016). Likewise, the average length of nursing is recorded as 31.9 months for Bangladesh for children under 5 years of age (Akter and Rahman, 2010). The successes of these countries are attributed to the significant efforts placed by the governments collaborating strongly with the World Bank (and with other organizations) and making investments at sufficient levels.

In Turkey, the Turkish Ministry of Health (MoH) has taken actions to boost the breastfeeding rates since 1991. In 1991, the MoH launched the "Breast Milk Promotion and Baby-Friendly Health Organizations Program", which was developed in compliance with the breastfeeding recommendations of the WHO (MoH, 2020). To that extent, the MoH started to establish "Mother and Baby-Friendly Hospitals" where expectant mothers are informed about the mutual benefits of breastfeeding from the very beginning of gestation. There are trained midwives and nurses responsible for teaching expectant mothers the appropriate breastfeeding techniques immediately after the birth. Throughout Turkey, 61 cities host the Mother and Baby-Friendly Hospitals, whose current number is around 1,302 with 452,000 annual births (MoH, 2019, 2020). To be more precise, 56.0% of the total births in Turkey takes place in these Mother and Baby Friendly Hospitals (MoH, 2020). Besides, the Social Security Institution (SSI) has started providing "breastfeeding allowance" on a monthly basis since 2019. A monthly payment of 232 Turkish Liras (TL) is made to workers and civil servants who have paid their insurance premiums for a certain period of time.

Despite the efforts placed by the MoH, the statistics regarding the breastfeeding practices are -unfortunately- far from being promising. According to the data collected by the Hacettepe University Institute of Population Studies (HIPS) (HIPS, 2003, 2008, 2013, 2018), the median breastfeeding duration is recorded as follows: 11.9 months in 1998, 14.1 months in 2003, 16.0 months in 2008, 15.7 months in 2013, and 16.7 months in 2018 (i.e., the median months include children born 3 years before the survey year). There is also improvement in the exclusive breastfeeding from 1998 to 2018: 14.0% in 1998, 20.80% in 2003, 41.60% in 2008, 30.10% in 2013, and 41.70% in 2018[1]; nonetheless, Turkey still lags far behind other middle-income countries (e.g., 27.2 months in Rwanda for children under three years of age, 31.9 months for Bangladesh for children under five years of age) (Akter and Rahman, 2010; Rwanda Demographic and Health Survey,

[1] The percentages are calculated for the children born 2 years preceding the survey year. That it, it does not include all children aged under 5.

2016). Therefore, it appears that Turkey has a long way to reach the universal goals.

To understand the correlates of breastfeeding practices (i.e., its exclusivity and duration), researchers conducted several studies. Substantial portion of this research comes from the medical literature (e.g., Yeşinel, 2007; Şencan, Tekin, and Tatlı, 2013; Eren et al., 2018), where the data is collected from the mothers who previously visited the pediatric clinics of hospitals. Since the data used in their research is not suitable for making population-level inferences, their findings may not provide fruitful information for the health professionals and policy makers to increase the breastfeeding rates. At this point, the HIPS provides a nationally representative data under the name of the Turkish Demographic and Health Survey(s) (TDHS) since 1993 using a multi-stage, stratified, cluster sampling method (HIPS, 2003, 2008, 2013, 2018). The TDHS collects data from ever-married women (i.e., aged 15-49) on various topics ranging from basic demographic information to fertility records and several health indicators of themselves and their offspring. Except for Usta (2020), no empirical analyses have been carried out using the TDHS series to reveal the determinants of breastfeeding practices. In fact, Usta (2020) considers only the schooling of mothers as a potential determinant of the breastfeeding duration. Other possible correlates (i.e., sex of child, age of mothers, and/or household composition variables) are not taken into consideration in her research.

In sum, there is a paucity in the literature on the determinants of the exclusivity and duration of breastfeeding for the Turkish context. By pooling the 2008 and 2013 rounds of the TDHS, each of which are individual-level and cross-sectional surveys, we aim to quantify the determinants of breastfeeding practices (as measured by the exclusivity and duration of breastfeeding). For our research, the TDHS is an excellent source of data because it includes the complete birth histories of women at childbearing age as well as household characteristics. To that extent, there are two main variables of interest both of which are defined for the mothers' youngest child (i.e., the last-born children). The first one is the breastfeeding

duration as measured in months that the mother reports to nurse her offspring. The second one is a dichotomous variable showing the exclusive breastfeeding status of the children. To quantify the correlates of breastfeeding practices, we employ the Ordinary Least Squares (OLS), Linear Probability Model(s) (LPM), and the Cox Regression Models. The empirical analyses regarding the breastfeeding duration reveal the following results: 1) a significant improvement across survey years; 2) a gender discrimination in favor of boys; 3) an advantage for normal- and high-birth weight children, 4) no evidence for maternal education, 5) positive effects of having older siblings and older brothers. For the exclusive breastfeeding status, there are two important factors that increase the likelihood of being exclusively breastfed: 1) living in urban Turkey; and 2) having a mother who has a secondary school diploma (as compared to having a mother who is a primary school dropout and/or lack formal education). We believe that our findings aid producing effective public health policies to boost the breastfeeding practices in a middle-income country, where the formation and accumulation of human capital is critical for the economic growth in the long run.

The rest of this thesis is structured as follows. In Chapter 2, we first aim to provide a review of the literature. Second, we introduce our data, the set of dependent and independent variables in Chapter 3. Then, in Chapter 4, the empirical strategies are elaborated by providing their theoretical formulations. Following this, we present and discuss our estimation results in detail. Finally, we conclude in Chapter 6 by summarizing the main findings highlighted in Chapter 5 and discussing potential policies that bring the breastfeeding rates closer to the global recommendations.

CHAPTER 2

LITERATURE REVIEW

This chapter is devoted to reviewing the literature. In this respect, we first concentrate on the mutual health benefits of breastfeeding for mothers and their offspring by discussing its three core components (i.e., initiation, exclusivity, and duration). Then, since the primary variables of interest are "breastfeeding duration" and "exclusive breastfeeding", we discuss their determinants. To do so, we mostly rely on empirical literature from medicine and economics. Nevertheless, the determinants are presented under four sub-sections considering the following characteristics: children, maternal, household, and regional. Finally, we focus on the empirical investigations coming the Turkish context and then state our contribution(s) to the current literature.

2.1. The Importance and Health Benefits of Breastfeeding

Protecting and encouraging breastfeeding have become a priority when designing public health policies because it gives rise to reduced costs of healthcare utilization, healthier societies, and more productive labor forces (UNICEF, 2018). To maintain breastfeeding, several international campaigns have been initiated. These include The Global Strategy on Infant and Young Child Feeding led jointly by UNICEF and WHO in 2002. The Global Strategy has been adopted by all WHO member states and established a base for public health initiatives to prevent the low rates and early cessation of breastfeeding. Similarly, International Code of Marketing Breast milk Substitutes was adopted in 1981 by WHO to ensure incidence, exclusivity, and duration of breastfeeding as well as to introduce the accurate use of breast milk substitutes in case of necessity. Finally, the European Union's (2008) Protection, Promotion and Support of Breastfeeding in Europe

emphasizes the supranational notice in advocating breastfeeding. In the United Kingdom, the campaign is run under the banner: U.K. Baby Friendly Initiative.

According to the UNICEF (2018) and WHO (2001), breastfeeding -initiated within the first hour of birth, provided exclusively for the first six months of life, and maintained up to two years of age- is a vital practice in contributing to the infants' survival chance and healthy growth. Maternal breast milk has a unique composition containing all the necessary nutrients (e.g., disinfectant agents, digestive enzymes, and trophic factors[2]) that babies need for an optimal growth. The gains from breastfeeding include both infants and their mothers. For infant health, breastfeeding does not only provide immunity against contagious diseases and chronic illnesses such as incidence of asthma (Pentice, 1996; Dyson et al., 2006), but also prevents sudden infant death syndrome and food-borne infections through the transfer of antibodies in the mother's body to the baby (Howie et al., 1990). Thereby, the maternal breast milk is acknowledged as the primordial vaccine against death and several ill-health conditions (UNICEF, 2018). Regarding the children's survival rates, on a yearly basis, promoting breastfeeding has the power to save the lives of 900,000 children aged 0 to 5 years, 87.0% of whom are infants under six months of age (Victora et al., 2016). In addition to this, it is found that there are long-term benefits of breastfeeding associated with the early childhood development indicators (e.g., cognitive and behavioral functioning). Since cognitive development emerges at the very early stages of life, the magnitude of timely maternal investments has been progressively accepted as a principal factor in contributing to the child development (Carneiro and Heckman, 2003; Feinstein, 2003). Thus, an extensive recognition of the association between breastfeeding and different aspects of child development is crucial for an understanding of the intergenerational transmission of human capital, and social policies aiming to minimize inequality in health across continents. Depending on these, the medical literature agrees on the fact that breast milk contains important

[2] Trophic factors provide the formation and accurate orientation of motor neurons within each stage of growth starting from birth. (Romo et al., 2014).

acids (e.g., long-chain polyunsaturated fatty acids that are stored in brain and eyes) and anti-inflammatory properties, which positively affect the neural development and thus cognitive functioning (Innis, 2004; Petryk et al., 2007). The evidence coming from a great extent of epidemiological research shows that exclusively breastfed children hit significantly higher scores in intelligence quotient (IQ) and other aptitude tests compared with their formula-fed/predominantly-fed counterparts, even after controlling for birthweight and duration of pregnancy (Anderson et al., 1999; McCrory and Murray, 2012). Besides, there are plenty of suggestive findings indicating that the level of intestinal microbial found in breastfed babies substantially differs from those non-breastfed (Azad et al., 2013). Higher levels of intestinal microbial triggered by breastfeeding is crucial because it boosts myelin production[3], which immediately contributes to infants' brain functioning (Diaz et al., 2011; Deoni et al., 2013). Overall, it should be acknowledged that there is a positive association between breastfeeding and infants' neuronal development that results in enhanced reasoning, cognition, and attitude. As stated above, the large health benefits of breastfeeding for mothers are non-negligible. First, the risk of having postpartum hemorrhage[4], which is responsible for a large fraction (25.0%) of worldwide maternal deaths, can be reduced via breastfeeding (WHO, 2015). Second, breastfeeding can be viewed as a natural birth control method because it delays the menstruation to get back to its regular schedule. Third, the incidence of pre-menopausal breast cancer and cervical cancer are found to be less common among women who have ever-breastfed their offspring as compared to those who have never breastfed (Gartner et al., 2005; Kramer and Kakuma, 2012; WHO, 2015).

[3] As infants grow, their nerves are covered with a substance called myelin. Linoleic and linolenic acid is needed for myelin formation and these acids are abundant in breast milk (Pentice, 1996).

[4] It is defined as a vaginal bleeding, which exceeds 500 ml blood, following the vaginal birth (WHO, 2015).

2.1.1. Three Core Components of Appropriate Breastfeeding

WHO (2016) states that almost all mothers, with few exceptions, are eligible to breastfeed their children. Nonetheless, the absence of breastfeeding can be justified due to some health conditions that are either stemming from infants or mothers. The infant health conditions that pose an obstacle for breastfeeding include very low birth weight (i.e., infants born lower than 1,500 grams), very pre-term babies (i.e., infants born before the 32nd week of the pregnancy), and those in need for extra glucose. Besides, mothers with human immunodeficiency virus (HIV) or with severe illnesses that prevent them from taking care of their baby (e.g., sepsis) can permanently or provisionally avoid breastfeeding (WHO, 2016). If these health conditions are absent, meaning that the mothers have no barriers to breastfeed their offspring, women are recommended to follow the international guidelines, which are: 1) putting baby into breast following the first hour of labor (i.e., early initiation of breastfeeding); 2) feeding infant with only breast milk for the first six month of life (i.e., exclusive breastfeeding); 3) continuing nursing up to two years of age with an appropriate complementary feeding. Each component has unique benefits in contributing to the infants' early childhood and future health outcomes.

First, the early initiation of breastfeeding (i.e., putting newborns to the breast within the first hour of delivery) is unarguably vital in saving newborns' life during the riskiest period for survival, namely the neonatal period (i.e., the first 28 days of life). The majority of deaths stemming from preventable infections, including pneumonia, tetanus, and diarrhea occur at that period. All of them are previously proved to be prevented with the receipt of colostrum[5] (also known as "first milk") in the first hour of life (UNICEF, 2018). Therefore, any delay in the initiation of breastfeeding is unfortunately associated with increased neonatal deaths and life-threatening consequences. Recently, a meta-analysis, which pools five studies,

[5] The first form of the breastmilk, which is rich in antibodies and proteins fighting against infections and harmful bacteria (WHO, 2019).

was conducted to identify the relationship between the early initiation of breastfeeding and mortality during the neonatal period for 136,000 infants (aged 0-12 months). More precisely, infants who were put to the breast between 2 and 23 hours after delivery are more likely to die (33.0% or 1.3 times) as compared to infants who were put to the breast within one hour of birth. In fact, waiting more than 24 hours increases the risk of death by more than two times in comparison to those who were put to the breast in the first hour (Smith et al., 2017). The results simply imply that the longer newborns wait, the greater the risk of death. When it comes to the determinants of timely initiation of breastfeeding, the medical literature shows that ethnicity, occupation, place of birth, and mode of delivery are significant correlates of early initiation (Adhikari et al., 2014). Besides, knowledge -gained through breastfeeding education from midwives- about the benefits of early initiation in terms of reducing infant mortality and morbidity can be an effective factor in encouraging mothers to start breastfeeding as early as possible. Therefore, breastfeeding education can also be a predictor of the immediate initiation of breastfeeding. In this vein, the literature presents robust evidence on the effect of breastfeeding education on the timely initiation of breastfeeding. That is, women who participated in antepartum breastfeeding education are found to practice early initiation more than those who have never engaged in such education (Doğa-Öcal et al., 2017; Ahmed and Salih, 2019).

Second, exclusive breastfeeding refers to the situation in which infants are solely fed through breast milk, and no other liquids including water and solid or semi-solid foods are given, except for salt solutions to tackle dehydration, vitamin supplements, and medicines (WHO, 2008; Hossain, 2018). At the end of the first six months, infants can be given nourishing liquids and supplementary foods, and breastfeeding practices can last until infants turn the age of two or more. Scientists studying the advantages of exclusive breastfeeding over other types of breastfeeding practices such as predominant breastfeeding[6] and complementary

[6] Infants can receive water and water-based drinks in addition to breastmilk (WHO and UNICEF, 2008).

feeding[7] have conducted several studies. To that extent, Sankar et al. (2015) point out that infants aged zero to five months who were predominantly or partially breastfed are at higher risk of infection-caused mortality compared with exclusively breastfed infants during the first year of life. By emphasizing the strong correlation between under-five mortality and exclusive breastfeeding, Biks et al. (2015) report that the chance of survival for infants significantly reduces in the absence of exclusive breastfeeding practice. In particular, their findings show that non-exclusively breastfed infants are eight times more likely to die. Furthermore, medical research provides evidence that the exclusive breastfeeding is associated with lower rates of hospitalization due to the acute respiratory disorders and gastro-intestinal diseases (Bachrach et al., 2003; Duijts et al., 2010). Besides, the literature provides evidence for other potential benefits of the exclusive breastfeeding. For instance, the prevalence of exclusive breastfeeding up to 6th month of age significantly influences anthropometric indicators such as weight and height of children under the age of five (Marques et al., 2015). In addition to its health benefits, the duration of exclusive breastfeeding is found to be a relevant factor in accelerating physical acquisitions such as crawling and walking. Dewey et al. (2001) point out that children exclusively breastfed for four months start crawling and walking later than children exclusively breastfed for six months – implying an advantage in the acquisition of gross motor skills.

As can be seen, the health benefits of timely initiation and exclusivity of breastfeeding are widely recognized. Nevertheless, the literature agrees on the fact that achieving optimal growth and acquiring maximum gains from breastfeeding are intimately linked with its duration. According to WHO (1985), the term "duration of breastfeeding" refers to the age of the child (in months) at the time of complete weaning, independent of the time when the supplementary nutrients are introduced. As stated above, the international guidelines recommend mothers to maintain breastfeeding until their children reach 24 months of age or beyond with

[7] Infants can receive any food or liquid including non-human milk and formula besides breastmilk (WHO and UNICEF, 2008)

an appropriate diet. Both mothers and their children take advantage of the extended duration of breastfeeding practices. Although there is evidence illustrating that receiving human milk during the first six months of life is critical for both physiological and neural development of infants, it is necessary to recall the fact that it takes two to five years for a child's immune system to be completely mature (UNICEF, 2010). Therefore, children, up to the age of five, are still vulnerable to several communicable and non-communicable diseases that may result in death. Since breast milk includes various cellular and extracellular components (e.g., antimicrobial factors such as lactoferrin, immunoglobulins, enzymes, neutrophils), it has a complementary nature for children's immune system as long as it is provided (WHO, 2010). In that respect, following the international guidelines regarding the recommended duration of breastfeeding can make children stronger against diseases and thus make them healthier in the long term. In addition to the immune system gains, prolonged breastfeeding is found to be related to the children's cognitive development. For instance, in one of their research, Mortenson (2002) find that babies breastfed for seven to nine months or longer have on average an IQ about seven points higher than babies breastfed for less than a month. The positive association between cognitive achievement and breastfeeding is also highlighted in many studies concluding that the largest gains for those children breastfed the longest (Horwood and Fergusson, 1998; Angelsen, 2001; Lee et al., 2016). Also, the results of an eight-year longitudinal study indicate that the duration of breastfeeding is related to the behavioral disorders that have the potential to affect the academic performance of pupils. In particular, the study shows that conduct disorder is much prevalent among those who received breast milk less than or equal to four months as compared to those who continued to receive breast milk for more than 12 months (Fergusson et al., 1987). Furthermore, other non-cognitive outcomes such as emotional suffering, anti-social behavior, and hyperactivity, are found as powerful correlates of the early termination of breastfeeding (Borra, Iacovou and Sevilla, 2012). For mothers, a longer duration of breastfeeding has been associated with the reduced risk of having ovarian cancer, endometrial cancer, type II diabetes, and hypertension (Stuebe et al., 2005; Palmer et al., 2014; Sung et al., 2016). In sum, it can be said

that extended breastfeeding translates into greater health gains for both the provider (the mother) and the receiver (the infant). As a result, the formation and accumulation of human capital can be attributed to extended duration of breastfeeding, which promises an optimal physiological and cognitive development and thereby healthier populations.

2.2. The Determinants of Breastfeeding Duration and Exclusive Breastfeeding

2.2.1. Child Characteristics

2.2.1.1. Sex

In comparison with the developed countries, female infants are found to be weaned earlier than their male counterparts in developing countries such as India, Bangladesh, and China (Sen et al., 2020). Nevertheless, it is hard to come across an evidence suggesting for such a gender gap in breastfeeding in developed countries. To that extent, literature divides parental gender bias towards breastfeeding into two branches. The first branch is in search of whether the factors leading to such a gender gap are purely country related. A recent study from economics literature reveals that women unconsciously (and biologically) determine the fetal sex-ratio to maintain their generation when exposed to negative events during pregnancy because of large testosterone shocks (which occur because of exposure to adverse events) (Dagnelie et al., 2018). This is known as mothers' ability to produce "secondary sex ratio" which refers to the odds of a fetus' being boy. The examples of such adverse shocks include, but not limited to, environmental pollution and exposure to violent events (e.g., terrorism, social conflict, and/or starvation). The key fact here is that secondary sex ratio occurs because of mothers' unconscious desire to protect its generation in the future. Therefore, women -unconsciously- place more value on the health outcomes of their male offspring. In low- and middle-income countries (e.g., Pakistan, India, and Zimbabwe), where under-five mortality is high due to the limited access to

healthy food and non-contaminated potable water as well as insanitary environmental conditions, breastfeeding is undoubtedly the most cost-effective and a contamination-free way for mothers to feed their offspring (Feachem et al., 1984; Palloni and Millman, 1986; Habicht et al., 1988). Considering the various health benefits of breastfeeding (e.g., especially its huge potential to reduce neonatal mortality), it would not be odd for mothers to favor their sons than daughters in such societies. The theory of secondary sex ratio also supports the findings of Jayachandran and Kuziemko (2011) who show that son-preference in breastfeeding among the Indian mothers is a result of the women's fertility preferences. To be more precise, the Indian women are found to perceive nursing as an obstacle to fecundity and thus wean girls earlier to conceive again. Although Jayachandran and Kuziemko (2011) do not discuss the possible existence of secondary sex ratio, it seems that one of the unobservable factors contributing to mother's fertility preferences can be mother's feeling that her future generation is endangered. Besides, there are studies considering other country-specific factors such as socio-economic outcomes of the society, degree of urbanization, male superiority in the provision of household income, religious attachments, and adherence to ethnic bonds (Pande et al., 2007; Almond et al., 2013; Sen et al., 2020).

The second branch of the literature considers bio-psychosocial differences between girls and boys in explaining the female disadvantage in breastfeeding. In the medical literature, the evidence on the acquisition and development of motor skills (i.e., fine-motor skills: coordination of small muscles; gross-motor skills: ability to crawl, sit, and stand up) during the first year of life is in favor of girls (Bala et al., 2009; Morley et al., 2015; Moser and Egil., 2017). That is, female babies are more prone to obtain these early motor skills earlier than their male counterparts (Singer et al., 1997; Cho et al., 2010; Dinkel and Snyder, 2020). Furthermore, some studies show that boys are more likely to experience death following the first month of the birth because respiratory infections are found to be more common in boys than girls (Bartels et al., 2005; Friedrich et al., 2006).

Altogether, mothers might think that boys need more protection and care than girls.

In the aftermath of documenting such a sharp male-advantage in the breastfeeding duration, the empirical results indicating either no difference across sexes or female-advantage in exclusive breastfeeding might be surprising – especially in low- and middle-income countries. In this vein, Chakravarty (2015), who previously provides robust evidence on the son-biased breastfeeding in Egypt using several rounds of the DHS (i.e., 1995, 2000, 2003, 2005 and 2008), shows that probability of consuming liquids and/or solids before 6th month of age does not differ across male and female infants. He justifies his findings by stating that gender gap in "breastfeeding duration" occurs after 1st year of life. Thereby, the Egyptian mothers are anticipated to be indifferent between sexes towards any breastfeeding-related decision (including exclusive breastfeeding) before 12-month of age. Moreover, Kabir et al. (2010) conduct a similar study for Bangladesh where children under five are at risk of several ill-health conditions due to the unhygienic environment. They use 2004 round of the DHS for Bangladesh to determine the factors contributing to the exclusive breastfeeding. Their findings imply that the odds of being exclusively nursed for the first six months of life is higher for female babies. For this study, the authors address the fact that mother's female-favoring behavior may not be deliberate. Instead, they argue that if mothers knew enough on the health benefits of exclusive breastfeeding, they would favor their son. Therefore, the level of health literacy in Bangladesh is already at lowest which potentially makes women indifferent about exclusively breastfeeding their offspring regardless of their gender. However, the evidence coming from high income countries such as Italy -where health literacy of women can be assumed to be higher than Bangladesh- also do not show a gender gap in exclusive breastfeeding (Lindau et al., 2014). Thus, one can readily conclude that the exclusive breastfeeding outcomes are not dependent to the gender of children.

2.2.1.2. Birth Month

At first, it is worth noting that the literature does not provide evidence indicating that birth month of a child has an effect on the duration of breastfeeding (Jayachandran and Kuziemko, 2011; and Chakravarty, 2015)[8]. Yet, despite limited number of evidence, earlier research argues the exclusivity of breastfeeding is highly connected to the month of delivery. To that extent, studies from the medical literature indicates that the weather in which children are born are highly likely to shape mother's behavior towards exclusive breastfeeding. By using a cross-sectional data from almost 20.500 mothers of infants under 6-month of age Das et al. (2016) conducted a study for India to explore the effect of seasonal variation (stemming from the timing of birth) on the exclusive nursing practices. Their findings suggest that mothers who gave birth during the months of winter are most likely to practice exclusive breastfeeding than mothers experience childbirth during autumn, spring, and summer, respectively. In addition, winter-born babies are more inclined to follow the recommended duration of exclusive breastfeeding (i.e., 6^{th} month) than those born in remaining seasons. Despite the absence of up-to-date evidence, similar findings are previously produced by Samuelsson and Ludvigsson (2001) for Sweden and Sellen (2001) for Tanzania. To explain the early termination of exclusive nursing for children born in warmer months, Das et al (2016) argue that the temperature in non-winter months is considerably higher, which in turn make women believe that their infants are thirsty, and the breast milk is not sufficient to meet their need of water. Thus, mothers may choose to switch predominant and/or complementary feeding earlier than the recommended time. At this point, the TDHS provides the birth month of the youngest children, which in turn allows us to assess the impact of birth month on the uptake of exclusive breastfeeding. However, it should be noted that the birth-month and birth-year dummies are included as fixed effects following the earlier research (Jayachandran and Kuziemko, 2011; Chakravarty, 2015).

[8] As in this thesis, Jayachandran and Kuziemko (2011) and Chakravarty (2015) include the birth-of-month dummies as fixed effects. In their regression results, they do not report the birth-of-month coefficients because they do not find any difference across months.

2.2.1.3. Weight at Birth

Birth weight of children is an important correlate of several health outcomes during the neo-natal period, early childhood, and puberty (Rito et al., 2019). The global classification of the children's weight at birth is determined by the WHO as follows: Low birth weight (LBW) covering infants below 2.5 kilograms, normal birth weight (NBW) covering infants between 2.5 and 4.0 kilograms, and high birth weight (HBW) covering infants above 4.0 kilograms (WHO, 2004). The survival chance of newborns is intimately connected with their birth weights, where the likelihood of neonatal mortality is highest for LWB infants (Stoll et al., 2010; Gill et al., 2013). At this point, children categorized under LWB are at higher risk of experiencing numerous neo-natal morbidities such as cardiac insufficiency, hearing deficits, anemia, and respiratory complications, each of which have a potential to boost rate of being hospitalized (Gebregzabiherher et al., 2017).

The presence of LWB contributes negatively to the exclusivity and length of breastfeeding and the potential pathways through which LBW hinders breastfeeding practices explained in the literature as follows. First, LWB children's reflex of sucking is found to be less-developed as compared to NBW and HBW children (Yeşinel, 2007). Second, LBW infants are more likely to be hospitalized as a result of aforementioned neonatal complications (Gill et al., 2013). Unfortunately, this significantly reduces the time a mother and her baby spend in skin-to-skin contact. As a result, the likelihood of supplementary food initiation earlier is higher violating the recommended duration of the exclusive breastfeeding. Third, WHO (2006) provides evidence that LWB newborns are three times more likely to be incubated immediately after labor (where incubation period lasts between 3 to 7 days, on average). This brings about a delayed initiation of breastfeeding, which in turn negatively affects the mothers' milk production. Altogether, the literature of medicine agrees on the fact that the exclusivity and duration of breastfeeding are adversely affected once newborns are below 2,5 kilograms (Chaves et al., 2007; Flaherman et al., 2013; WHO, 2019).

2.2.2. Maternal Characteristics

2.2.2.1. Age

Mother's age at birth is found to be a relevant factor in determining the length and exclusivity of breastfeeding. However, it is hard to obtain consistent evidence on the direction of relationship. That is, some portion of the early research shows that experiencing motherhood at later ages (i.e., especially after 35) results in early cessation of (exclusive) breastfeeding compared to motherhood at early 20s (Mundagowa et al., 2019; Woldeamanuel, 2020). On the other hand, the children of younger mothers (i.e., below the age of 30) are found to be at risk of being weaned earlier than whose mothers are above 30-year of age (Kaneko et al., 2006; Hauck et al., 2011; Liu et al., 2013).

Unlike the inconsistent results for breastfeeding duration, the findings on the effect of maternal age on practicing exclusive breastfeeding are -almost- conclusive. A number of research from different countries argue that the probability of feeding infants via solely breast milk for the six month of life increases with the age of mothers (i.e., generally after 30) (Sholeye et al., 2015; Maonga et al., 2016; Yeboah et al., 2019).Nevertheless, a branch of literature points out a certain age, which is regarded as a barrier to maintenance of exclusive breastfeeding for the six months of age (i.e., 25 years of age) (Wardani et al., 2017; Mundagowa et al., 2019; Manyeh et al., 2020).

The presence of inconclusive findings (for the breastfeeding duration) implies that there might be additional reasons -varying with respect to age- that potentially contribute to the length of nursing. To that extent, studies first consider sudden nipple mastitis and/or nipple fissure (generally occur following the four weeks after delivery), both of which are observed especially after the age of 30 (Spencer, 2008; Colombo et al., 2018). According to the WHO (2000) that about 10.0% of lactating women worldwide develop mastitis. The incidence of such factors is found to deter mothers from breastfeeding if timely initiation of treatment is not

received. Therefore, the medical literature recommends controlling for such mother-related factors when making inferences about the effect of maternal age on the duration of nursing (Cullinane et al., 2015). Nevertheless, the TDHS does not collect data on whether and when mothers experience the post-natal infections. Therefore, we are unable to account for the presence of breast infections whose incidence increases with age.

2.2.2.2. Education

There are large number of studies indicating that better-educated mothers are more inclined to be knowledgeable about the health benefits of breastfeeding and thereby are more prone to practice it (Bertini et al., 2003; Zhao et al., 2017). Nevertheless, it would not be accurate to argue that there is always a positive association between the breastfeeding duration and maternal schooling. Despite the large number of earlier research indicating that any increase in the maternal education induce a delay in the timing of being weaned (e.g., Hauck et al., 2011; Sarki et al., 2018; Tang et al., 2019), there exists studies concluding otherwise (e.g., Liu et al., 2014; Qin et al., 2017; Chen et al., 2019). On the other hand, it must be noted that some other research argues that mother's schooling and how long they nurse their offspring has no relationship (Tang et al., 2013; Guo et al., 2013).

The presence of inconclusive empirical findings can also be seen for exclusive breastfeeding practices. Even in the countries with similar income levels, it is difficult to come across any consistency in the results. For example, mothers with an advanced level of education (i.e., tertiary education) are found to less adherent to exclusive breastfeeding than mothers having secondary school diploma in Ghana (Asare et al., 2018). However, Giashuddin et al. (2003) and Zhao et al. (2017) provide contradictory results implying that children of less-educated (i.e., illiterate and/or primary school graduates) mothers are nutritionally fare worse than children of better-educated mothers (i.e., secondary school and higher) in Bangladesh and China, respectively. In addition, some findings suggest a U-

shaped effect of maternal schooling on adherence to exclusive nursing. An up-to-date evidence comes from Saudi Arabia, where Alshammari and Haridi (2021) illustrate that the prevalence of exclusive breastfeeding increases among primary-school graduates, decreases among secondary-school graduates, and then jumps among those participated in higher levels. The authors explain the U-shaped effect of maternal schooling as follows. Mothers with a low educational attainment have a strong attachment to traditional motherhood-roles of the society, where nursing is perceived as the immediate responsibility of women. That is, the perception of less-educated mothers is a repercussion of what was observed from their ascendants before they enter into marriage market. Nevertheless, better-educated mothers are assumed to have a greater health literacy and to be aware of the mutual health benefits of exclusive breastfeeding as in high income countries like Belgium and Taiwan (Vanderlinden and Van De Putte, 2017; Chang et al., 2019).

Nonetheless, there is an interesting aspect of the existing research. Among those who imply a positive association, none of them account for the potential for the endogeneity of schooling in their investigation. To that extent, knowledge, acquired through schooling, can be a potential channel encouraging women to breastfeed longer. In this respect, it can be argued that mothers' knowledge regarding the mutual benefits of extended breastfeeding can be correlated with the years of education. In turn, any increase in the educational attainment can influence mothers' feeding routines, causing their children to receive breast milk longer. Yet, the observed relation is not necessarily causal. As indicated above, none of the aforementioned studies have considered the possible endogeneity of mother's schooling. Any estimation not accounting for the endogeneity of schooling runs the risk of being biased. At this point, in one of her research Usta (2020) conducts a Regression Discontinuity Design (RDD) to investigate whether maternal education has a causal effect on several child health indicators, including breastfeeding duration. In her analysis, she utilizes a compulsory education law (CEL) that extended mandatory years from five to eight years as of the 1997-1998 School Year in Turkey. The policy promoted more schooling than would have otherwise been received among the Turkish women for whom the CEL was

compulsory. Her findings are of great importance for us because she also uses 2008 and 2013 rounds of the TDHS in her article. She finds no evidence on the effect of maternal education on the nursing length.

2.2.2.3. Employment

The employment status of mothers is reported as a prominent factor affecting not only the commitment to exclusive breastfeeding but also its length. To that extent, the children of mothers who are in the labor force are at risk of weaning and of initiating predominant feeding earlier. Thus, it is vital to protect their "right to be appropriately breastfed". According to the Maternity Protection Convention article numbered 183, the optimum duration of paid maternal leave should be at least 18 weeks following childbirth (The International Labor Organization (ILO), 2000). In fact, the business places are recommended to support women who breastfeed their babies. The latest policy suggestion raised by UNICEF considers a combined paid-leave system for both mothers and fathers as a total of 24 weeks, of which 18 weeks must be devoted to mothers. Yet, the data from UNICEF (2021) show that almost 60.0% of mothers are deprived of maternity benefits at workplace (e.g., support for breastfeed at work). In this respect, it is found that mothers in the labor force have less time to spend with their children and therefore come up with lower breastfeeding durations (Abdulwadud and Snow, 2007; Dashti et al., 2010; Chekol et a., 2017). The same is valid for practicing exclusive breastfeeding (Tadesse et al., 2019). However, it is much easier for mothers out of labor market to follow the universal recommendations on nursing length.

Another aspect that one should bear in mind that the opportunity cost of time increases for employed mothers (simply because they are better educated) (Card, 2001). Perhaps, women with higher educational attainment may not prefer to breastfeed longer since it may constitute a barrier to return work and thus to earn more. In fact, Chen et al. (2019) indicates that employed mothers in China are less likely to practice breastfeeding due to incompatibility of work and life balance. However, we do not include the mothers' employment status in our empirical

investigations due to difficulty of accounting for the confounding factors that simultaneously affect mothers' employment and their children's health outcomes.

2.2.2.4. Mode of Birth

Since the beginning of 1970s, there has been a worldwide growth in the rate of cesarean section, which translated into a major health concern. In 1985, it has been indicated that the optimum rate of CS, as one of the modes of delivery, should be between 10 and 15 percent at the population level (WHO, 2015). Nonetheless, the rate of CS has followed an increasing fashion in both developed and developing countries throughout the years (Betrán et al., 2016). In the medical literature, there is no doubt on the fact that CS is highly effective in preventing maternal and newborn mortality in case of any anticipated or unforeseen complication. But on the other hand, researchers did not find any evidence implying that CS has positive effects on maternal and infant health outcomes unless it is medically obliged. Like all other surgical operations, there are possible short- and long-term effects of CS that can constitute health-related risks for mother, newborn baby, and subsequent pregnancies. These risks include the incidence of uterine rupture, stillbirth, abnormal placentation (for mothers) and the incidence of type-I diabetes, and asthma (for infants) (WHO, 2015; Sandall et al., 2018). Despite the presence of these risks, WHO (2015) report that cesarean rates above 10.0% (at population level) cannot be associated with reductions in maternal and infant mortality rates. In fact, the literature of medicine on the potential influences of CS rates on additional outcomes like maternal and perinatal morbidity, and psychological or social well-being is scarce. Besides, it is worth noting that the burden of operative deliveries is not only limited to health problems, but also includes increased medical costs implying an economic burden for countries. At this point, Turkey has also experienced a dramatic increase in CS rate since late 1980s. The percentage of CS -comprising all births- jumped from 5.7% in 1988, to 14.2 % in 1996, and to 27.7% in 2001. In fact, this rate was found as 30.3% in 2001 when births at home are not included (Koç, 2003). This seems to be alarming according to WHO's 10 to 15 percent range for optimal CS rate.

Recently, Şantaş and Şantaş (2018) conduct a more detailed research by using the 1993, 1998, 2003, 2008, and 2013 waves of the TDHS to identify the determinants of CS in Turkey. Their results show that CS rate increases with mother's age and educational attainment at childbirth. Additionally, residing in the Western region and urban areas, and living in households with the highest wealth quintile increase the odds of giving birth via CS.

In the medical literature, there is an agreement on the fact that the mode of delivery plays a significant role especially in the exclusivity and maintenance of breastfeeding. The benefits of vaginal birth for breastfeeding practices outweighs the benefits of CS, especially for the uptake of breast milk exclusively for the first six months and its continuation with an appropriate diet in the succeeding months (Brown and Jordan, 2013; Hobbs et al., 2016; Kitsantas and Palla, 2017). That is, the children of mothers whose mothers experienced CS are weaned earlier than those whose mothers deliver via vaginal birth because of the incision pain, delayed milk production, uterus contractions, and women's psychological instability after surgery (Rowlands and Redshaw, 2013; Arora et al., 2017). Nonetheless, researchers state that one should be cautious when investigating the effect of the "mode of delivery" on breastfeeding initiation and duration. That is, experiencing CS may or may not be an individual preference (i.e., it can be either medically obliged or mother's preference because there are less-painful and anesthesia-free methods like spinal epidural CS - which is less likely to affect breastfeeding practices). At this point, the majority of the births by CS are proved to stem from unforeseen emergency situations such as baby's position in the uterus and extreme-exhaustion of mothers -even after trying a vacuum-assisted delivery to aid women (Regan et al., 2013; Mylonas and Friese, 2015). To that extent, Yisma et al. (2019) place particular attention on this issue and warn researchers that the breastfeeding initiation and continuation may differ between medically-indicated and elective CS. Thereby, they recommend such a distinction before concluding that CS shortens the breastfeeding duration. However, since the TDHS does not make such a distinction, we are unfortunately unable to test it in this thesis.

2.2.3. Household Characteristics

2.2.3.1. Income Level

Before discussing how household wealth affects the duration of breastfeeding, it would be beneficial to provide information on how breastfeeding practices vary across countries. Recently, UNICEF (2018) collected data from 120 countries to understand the trends in the incidence and the length of breastfeeding. At first, their data suggest that proportion of children who are ever-breastfed at some point during infancy period does not differ across low- and middle-income countries. To that extent, the proportion of children who have never consumed breast milk is found to be only 3.90% on average. In other words, nearly 95.0% of infants are put to breast and receive breast milk. The data coming from 2008 and 2013 rounds of the TDHS also confirms what UNICEF (2018) highlight. In Turkey, the portion of children under-five who are never breastfed is estimated to be only 1.94% (TDHS, 2008, 2013). When it comes to high-income countries, the rate of "being ever-breastfed" varies a lot across countries and some countries fare worse than low- and middle-income countries. At this point, the United States and Ireland constitute great examples of such low rates of "being ever-breastfed" with 75.0% and 55.0%, respectively. The situation in countries like Sweden and Uruguay is in favor of babies, indicating that almost all of them receive breast milk at least for once (UNICEF, 2018).

To begin with, breastfeeding duration is found to be dependent on the household income (UNICEF, 2018). Nevertheless, the evidence is interesting once the income level of countries is considered. That is, the findings show that women living in high-income countries but residing in low-income households are more likely to experience "early weaning". In contrast, women living in low- and middle-income countries but residing in high-income households are more inclined to wean their children earlier (UNICEF, 2018). In the poorest households from low- and middle-income countries, nearly 65.0% of toddlers are shown to be nursed by the age of two. This rate is recorded as only 40.0% among the richest

households. It is crucial to indicate that the gap in the length of breastfeeding between the wealthiest and the poorest households is estimated to be almost 12.0% in Middle Eastern countries (UNICEF, 2018). Earlier research is in compliance with what UNICEF (2018) points out for the nursing length. For example, a study coming from Iran – classified as a middle-income country – suggest that household wealth is a significant predictor of the duration of consuming breast milk (Ajami et al., 2018). That is, infants (under 2 years of age) from the wealthiest households are unfortunately receive breast milk shorter as compared to their counterparts from poorer households. Conducting a longitudinal analysis (from 1998 to 2002) for Canadian babies, Dubois and Girard (2003) present evidence suggesting that there is a negative association between family income and breastfeeding duration. That is, the children residing in wealthier households are experiencing the event of breastfeeding for a shorter. Such interesting patterns in the breastfeeding duration in high-income countries are -generally- attributed to the differences in the governments' efforts to promote breastfeeding. That is, the interventions made by governments (e.g., midwife home visits and regular telephone-based communication with mother) to increase the awareness regarding the appropriate length of breastfeeding specifically target low-income households in high-income countries (Haroon et al., 2013). Nevertheless, the generalizability of these findings (i.e., children in wealthier households in low-income countries are more likely to experience prolonged breastfeeding and vice versa) is controversial due to the presence of studies suggesting the opposite. For instance, Heck et al. (2006) argue that there is a positive association between the family income and breastfeeding duration for American mothers living in California.

The empirical findings on the effect of household wealth on children's being exclusively nursed for the six-month of age are far from being conclusive. On one hand, there are studies suggesting that tendency to follow exclusive breastfeeding is higher in low-income households. For instance, Alshammari and Harid (2021) show that mothers' commitment to exclusive breastfeeding increases if they reside in low-income households in Saudi Arabia. Similar findings are reported from the medical literature for different countries implying that propensity to maintain

exclusive breastfeeding is found to increase in the poorer households (Jama et al., 2020). This might stem from financial hurdles that prevent mothers from buying infant formula or milk (other than breast milk). On the other hand, there are studies mentioning the increased exclusive breastfeeding in the presence of high-income levels (Kimani-Murage et al., 2011; Duan et al., 2018). According to the authors, the observed relationship may be attributable to the role of higher earnings in increasing the exposure to the media-delivered advertisements/campaigns which in turn boost the knowledge on the exclusive breastfeeding.

2.2.3.2. Sibship Size and Sibling Sex Composition

In theory, children provide utility to their parents. Nevertheless, the amount of utility is not only dependent on the quantity of children, but also depends on quality (Becker, 1960; Becker and Lewis, 1973; Becker and Tomes, 1976). To be more precise, the theory is known as the (child) quantity-quality trade-off put forward by Becker (1960). It simply suggests that the child quantity (as measured by the number of children) and child quality (as measured by the amount spent on per child to contribute to their human capital such as provision of extracurricular activities that boost cognitive ability) are subject to the household's budget constraint. This has a crucial implication: if expenditure per child increases (i.e., the increases in quality), then larger family sizes (i.e., the increases in quantity) would be more costly. Likewise, if the quantity rises, efforts to foster the quality turn out to be more expensive since the amount to be spent on quality expands for each child (Doepke, 2015). Depending on these, it is fair to say that the utility from the quantity first increases and then diminishes. Therefore, as stated by Jayachandran and Kuziemko (2011), an increase in the number of children is expected to increase breastfeeding duration up to a certain point. It is crucial to place emphasis on the term "certain point" because it is intimately related to the families' finite resources to be allocated to their offspring.

Any additional birth that reduces the utility because of the increased cost of childbearing may also constitute a barrier to the prolonged breastfeeding. In other

words, the number (older) of siblings is anticipated to extend breastfeeding duration as long as parental utility derived from childbirth increases (Jayachandran and Kuziemko (2011). Thereby, up to a certain point, extended breastfeeding practices can be considered as a health investment to children to improve their quality. Namely, parents will be willing to equally invest in their infants' health via feeding them with breast milk - if they do not derive disutility from raising another child. Altogether, it can be argued that sibship size is an important determinant of the breastfeeding length. Findings from the literature also confirms the theory explained above. Using 1992, 1998, and 2005 waves of the DHS for India, Jayachandran and Kuziemko (2011) provide evidence that one additional brother/sister significantly and positively contributes to the youngest children's duration of breastfeeding. However, as mentioned above, if the number of older siblings exceeds three, then the breastfeeding duration starts diminishing for the youngest children. Chakravarty (2015), who replicated the Jayachandran and Kuziemko (2011) study for Egypt using various rounds of the DHS, find the same results for Egyptian toddlers. Finally, when it comes to effect of sibship size on exclusive breastfeeding, the results of Chakravarty (2015) show that the likelihood of being given supplementary food before 6^{th} month of age significantly decreases (for the youngest child) with the higher number of older siblings. Salim and Stones (2020) use 2015 and 2016 waves of the DHS for Malawi and yield the same result: having older siblings extends the exclusive nursing period for the youngest child.

Regarding the (older) sibling sex composition, our point of departure is again Jayachandran and Kuziemko (2011) and Chakravarty (2015) because there is a dearth of evidence in the literature considering the sibling sex composition as a potential determinant of breastfeeding practices. In this vein, both studies point out that sex composition of older siblings is of great importance in explaining the differences in the length and exclusivity of breastfeeding. That is, their empirical investigations imply that any increase in the male fraction of older siblings is positively related to the prolonged breastfeeding and being exclusively breastfed. They explain their results with the fertility choices of mothers. In other words,

once mothers reach “enough” number of sons, they do not use breastfeeding as a method of contraception and therefore have a greater tendency to invest in their children’s health.

2.2.4. Regional Characteristics

2.2.4.1. Region and Place of Residence

Even though the number of studies testing whether breastfeeding practices vary with respect to spatial characteristics is quite limited, there exists evidence. In the United States, early weaning is found to be at the highest levels in South and at the lowest levels in North and followed by West (Ryan et al., 2004; Kogan et al., 2008). The authors explain the spatial differences by the implementation of “the legislation on breastfeeding initiation and duration” across states. As can be seen, they -indeed- test the effectiveness of a policy legislation. Thus, their results do not provide fruitful information on why states in South are fare worse off. For the exclusive breastfeeding, the evidence suggests that the American infants in the South are less likely to be exclusively nursed than infants in the West (Li et al., 2002). For this study, even though Li et al (2002) do not make any explanation, the South disadvantage may be attributable to the weather conditions. Perhaps, mothers think that their breast milk is not enough to meet liquid (especially water) need of their offspring, and then they decide to initiate predominant feeding earlier than 6th month. This might be a relevant research question for researchers in the future.

When it comes to rural/urban residence (i.e., type of place of residence), the empirical results differ by countries’ being developed or developing. That is, infants are found to be disadvantaged in urban Germany because they are weaned earlier than their counterparts residing in rural Germany (Kintner, 1985). On contrary, evidence from developing countries (e.g., India and Nigeria) show that children in urban areas experienced the prolonged breastfeeding (Adewuyi et al., 2017; Senanayake et al., 2019). Regardless of rural/urban residence, the results

may be attributable to the fact that mothers in developed nations are highly likely to be employed and thus have limited time to nurse their offspring, while mothers in developing countries are less likely to be in the labor force which provides them enough time for breastfeeding. Moreover, the previous studies agree on the fact that urban residence makes infants better off when it comes to being exclusively breastfed for the first six month of life (Perez-Escamilla et al., 1995; Shirima et al., 2001; Rollins et al., 2016; Hitachi et al., 2019). At this point, the authors argue that health benefits of exclusive breastfeeding are expected to be known in urban areas than in rural areas because of the following potential reason: the number of health facilities -where breastfeeding information can be readily obtained- may be higher in urban areas and/or exclusive breastfeeding campaigns are carried out urban areas.

2.2.5. Empirical Evidence from Turkey

As can be seen from the empirical literature, the determinants of breastfeeding practices (i.e., duration and exclusivity) are comprehensively discussed for different countries. The findings, except for some variables (e.g., birth weight), are far from being conclusive. For the Turkish context, there exists evidence on the correlates of breastfeeding as discussed in the previous sub-sections. Yet, the substantial portion of studies comes from the medical literature, where the data used for analyses are not nationally representative, and random sampling is not achieved. Therefore, making inferences at population-level becomes impossible. In turn, it prevents policymakers from understanding the potential hurdles in the achievement of breastfeeding practices, and thus from designing policies to improve public health. Nevertheless, it must be acknowledged that there is an up-to-date research conducted by Usta (2020). In her article, she uses the TDHS-2008 and -2013 rounds to explore the causal impact of mothers' schooling on a range of child health indicators, including the duration of breastfeeding for infants aged above 36- and 48-months of age. In fact, she does not consider "exclusive breastfeeding". Regarding her empirical results, she does not present evidence implying such a causal effect on the nursing length of children. In other words, she

finds no evidence. However, since her primary research question is not quantifying the breastfeeding length, she does not include the variables used in this thesis (except for mother's education). Hence, it can be argued that there is a dearth of evidence in the economics literature that explores the correlates of breastfeeding practices (i.e., its exclusivity and duration) in Turkey as a middle-income country, where public health policies are of great importance for future development. In this vein, we aim to reveal the determinants of breastfeeding practices by using a nationally representative data. To that extent, our research differs from the existing ones in the following ways:

- We utilize two rounds of the TDHS (i.e., 2008 and 2013) which provides nationally representative data when quantifying the potential determinants of breastfeeding duration and exclusive breastfeeding. Thus, our results will serve the health professionals to produce policies to boost breastfeeding rates across the country.

- Both rounds of the TDHS are cross-sectional. Therefore, children in our focus group (i.e., the youngest children) are observed once. However, we generate a longitudinal data by using the Case Identification Number, conditional on children's age (in months). By doing this, we have longitudinal (monthly) data spanning from month 0 (marking birth month of the child) to 59, or the current age of the child if the child is below age of 5. In turn, the child can be retrospectively monitored for each month of age starting from birth month. To date, no studies provide such a unique setting when investigating the contributors to breastfeeding.

- Finally, our results show a significant male advantage in the breastfeeding duration and a rural/urban gap in practicing the exclusive breastfeeding, neither of which has not been marked in the earlier studies.

CHAPTER 3

DATA AND DESCRIPTIVE STATISTICS

The data used in this thesis come from 2008 and 2013 rounds of the Turkish Demographic Health Survey (TDHS), both of which are nationally representative cross-sectional surveys. The TDHS has been carried out by the Hacettepe University Institute of Population Studies (HIPS) every five years starting from 1968. From 1968 to 1993, the HIPS conducted several surveys aiming to provide reliable, rich, and comparable demographic information. These surveys have been pursued under different names[9] in conjunction with the Ministry of Health. However, the surveys have been performed by following the standard Demographic and Health Surveys (DHS) Program in 1993 and onwards. Today, it has become possible to trace demographic changes covering nearly five-decade time-period thanks to surveys of the HIPS. The DHS Program aims to collect and analyze representative data at national level on the indicators of health, nutrition, and population in middle-income and developing countries whose current number are more than 90 (DHS Program, 2021).

The sample used in both waves of the TDHS are designed with a multi-stage, stratified cluster sampling approach. Both waves of the TDHS provide data at the following levels: type of place of residence (i.e., as measured by rural and urban residence), five regions of Turkey (i.e., West, South, Central, North, and East), and 12 regions of Turkey[10] determined by the first-level Nomenclature of Territorial Units for Statistics (i.e., NUTS-1). For Turkish context, it has been an

[9] Detailed information can be found in http://www.hips.hacettepe.edu.tr/nufus_arastirmalari.shtml .

[10] The regions included in the NUTS-1 level are as follows: Istanbul, West Marmara, Aegean, East Marmara, West Anatolia, Mediterranean, Central Anatolia, West Black Sea, East Black Sea, Northeast Anatolia, Central East Anatolia, and Southeast Anatolia.

excellent source of data for many researchers who previously aimed to assess the impact of demographic characteristics of women and children on various socioeconomic outcomes. For example, Dayıoğlu, Kırdar and Tansel (2009) provide evidence on how household composition (as measured by birth order, sibship size, and sibling sex composition) affects children's schooling outcomes in urban Turkey using 1998 round of the TDHS. More recently, Karaoğlan and Saraçoğlu (2018) utilize 2013 round of the TDHS to investigate the effect of parental socioeconomic indicators (as measured by several variables including parental education, region of residence, household size, living conditions) on children's health outcomes proxied by height-for-age z-score.

The TDHS is composed of two modules: Household Questionnaire and Women's Questionnaire. The Household Questionnaire is designed to enumerate all members of sample households and to gather information associated with the socio-economic characteristics of the households. The first part of the Household Questionnaire collects basic information from each individual listed as a household member. The information comprises age, sex, educational attainment, marital status, and relationship to the household head. One of the main objectives of the first part of the Household Questionnaire is to determine women who are eligible for the Women's Questionnaire. Women who are at childbearing age (between 15 and 49) and stayed in that household the night before the interview took place are eligible for being interviewed in Women's Questionnaire (THDS, 2008, 2013). In the second part of the Household Questionnaire, questions are designed to capture information on the characteristics of the household (e.g., number of rooms, the source of potable water, and the source of heating) as well as the ownership of a number of durable consumer goods (e.g., car and truck).

In the Women's Questionnaire, eligible women in the household are asked questions on the following topics: a) basic demographic information, b) migration records, c) complete marriage history, d) pregnancy, previous birth records, fecundity preferences, e) knowledge and usage of contraceptive methods, f) healthcare utilization: receipt of prenatal and postnatal care, g) breastfeeding,

nutrition, and vaccination status of children, h) employment history, and i) spouse's background characteristics. Besides, the anthropometric measurements[11] (i.e., height and weight) as well as exact date of birth of children (aged 0-59 months) are recorded conditional on their mothers' permission. It is worth noting that the questions related to child health outcomes are answered by mothers on behalf of their children.

In the TDHS-2008 (2013), 10,525 (11,714) households were interviewed. Of the 10,525 (11,714) households, the number of eligible and successfully interviewed women was recorded as 7,405 (9,746). This thesis mainly uses the Women's Questionnaire for the empirical analyses. To that extent, the 2008 and 2013 rounds of the TDHS are pooled, and the pooled sample includes 17,151 ever-married women without imposing any sample restriction. Before introducing the case of sample restriction criteria, it is necessary to elaborate the strengths and drawbacks of the THDS surveys. First, the TDHS is the only source of data that provides detailed information on the breastfeeding practices for the Turkish context. Thus, it perfectly serves the aim of this thesis. Another advantage of using the TDHS is the possibility of transferring variables from Household Questionnaire to Women's Questionnaire using Household Identification Number, Cluster Number, and Individual's Line Number – that correspond to Case Identification Number (eligible and interviewed) in Women's Questionnaire. To that extent, this thesis merges Household and Women Questionnaires for certain variables pertaining to household size (i.e., number of de facto and de jure household members which in turn makes possible to identify household composition readily). In addition, since the basic demographic information regarding the mothers' previous births is available, the number of (older) siblings and their sex composition can be easily calculated for the last-born child. Given its cross-sectional nature, the TDHS provides another crucial benefit deserving to be addressed. From a statistical standpoint, the datasets are made up of independently sampled observations, which imply one of the key features of analyzing cross-

[11] The TDHS also provides anthropometric measurements of mothers.

sectional data: elimination of correlation in the error terms across different observation (Wooldridge, 2015). Besides, despite a wide array of benefits, there is a potential drawback of the TDHS that should be pointed out. The variables concerning with breastfeeding practices (e.g., the duration of breastfeeding and the month of the receipt of first supplementary food) do not provide retrospective data for older children of mothers. Instead, it is only available for the last-born (i.e., the youngest) children of mothers. Thus, the analyses are limited with the last-born children (i.e., aged 0-59 months), which prevent researchers from producing comparable results across (older) siblings. Another potential disadvantage of the TDHS might be the exclusion of some questions from the succeeding rounds. For instance, the exclusion of questions related to exclusive breastfeeding from the 2013 survey makes results incomparable across years. The detailed information is presented under the Dependent and Independent Variables sub-section.

3.1. Sample Restriction(s)

To finalize the sample to be used for empirical analyses, the following restrictions are imposed. First, this thesis considers only ever-married women because childbearing prior to entrance in marriage market is rare in Turkey due to social norms (TDHS, 2013). In the THDS-2013, eligible women are asked the following question: "Have you ever been married?". Of the 9,746 women, 2,527 (25.92%) said "No". It is also worth mentioning that none of the 2,527 never-married women stated that they gave birth in the last five-year period. Therefore, one cannot argue that restricting sample to the ever-married women may end up with a loss of observations. For the THDS-2008, it is not necessary to put such a restriction since the Women's Questionnaire only includes the ever-married women. Second, women who did not give birth within the last five years are excluded from the sample. In the TDHS-2008, the number of women that did not give birth in five years preceding the survey is recorded as 4,421 (59.70%). Similarly, in TDHS-2013, 4,354 (60.31%) ever-married women did not experience the event of childbirth within the last five years. Finally, if the last-born child is no longer alive at the time of survey and/or lives in somewhere else, they are omitted. As a result,

the final (pooled) sample size covering children aged between 0 and 59 months is 5,571.

3.2. Dependent and Independent Variables

3.2.1. Dependent Variables

Within the scope of this thesis, there are two main response variables. The first one is "Breastfeeding Duration" to be analyzed for the pooled sample (i.e., TDHS-2008 and TDHS-2013). The second one is "Exclusive Breastfeeding (EBF) Status" which is only available for the 2008 wave of the TDHS due to the absence of the question(s) providing information on the month of the first supplementary foods receipt (i.e., liquids and solids).

3.2.1.1. Breastfeeding Duration

The first outcome variable, "Breastfeeding Duration", used in this thesis is measured in months as a continuous variable for the last-born children under five years of age. In the TDHS, mothers are asked the following question for their last-born child: "How many months did you breastfeed your child?". The answers are recorded in three forms as follows: 1) the mothers can respond the question by stating the exact month of breastfeeding if the child is weaned, 2) they can respond the question by stating that the child is still breastfed if the child is currently nursed at the time of survey, and 3) they can respond the question by stating that the child is never breastfed if the child has never been put to the breast. To ease the interpretation, for children whose mothers stated that they are still breastfeeding, the breastfeeding duration variable is replaced with the age of child (in months). Similarly, those who have never received breast milk since birth are given zero. It is worth noting that, the number of never breastfed children is 107 (i.e., 1.04% of the pooled sample. 53 of them come from the TDHS-2008, and the rest comes from the TDHS-2013) in the original data. Besides, it is crucial to indicate that all children who are aged 0 month are still breastfed without an exception (i.e., the

number of children aged 0-month is 35). To distinguish them from those never breastfed, the breastfeeding variable for children aged 0 month is replaced with 1. Following this specification, the mean breastfeeding duration for children under five years of age is found to be 12.68 months (SD=8.90).

One can argue that the above-mentioned specification might fail to capture the breastfeeding duration due to the presence of children who are not yet weaned. In other words, the variable breastfeeding duration does not distinguish completed breastfeeding (i.e., children who are already weaned) from on-going breastfeeding (i.e., children who are currently nursed). This implies that the breastfeeding duration is indeed right-censored. Before elaborating the case of right-censoring and its corresponding solution, it would be beneficial to summarize the breastfeeding duration variable in accordance with the situation indicating that whether children are still breastfed conditional on their age. Of the 5,561 children[12] (under five years of age), 2,000 of them continue to receive breast milk – corresponding to 35.90% of the sample. Nevertheless, it is necessary to impose a cut-off age (in months) when children are weaned to distinguish completed and on-going breastfeeding. Any analysis that does not control for right censoring may yield biased estimates. A viable approach to deal with right-censoring is to concentrate on the completed breastfeeding by considering toddlers to minimize the number of children who are still breastfed.

In their analyses for India, Jayachandran and Kuziemko (2011) state that the event of breastfeeding is almost completed when a child reaches 36-month of age. Chakravarty (2015), who replicated the study of Jayachandran and Kuziemko (2011) for the Egyptian context, points out the same argument implying that 36th month is a valid cut-off age to capture completed breastfeeding (i.e., 98.95% of children are found to be no longer receive breast milk after 36th month in this study). These studies constitute a relevant benchmark when determining the cut-

[12] The breastfeeding duration variable covers 5,561 children rather than 5,571 children because of the 10 missing observations in the question that asks, “How many months did you breastfeed your child?”.

off age to capture completed breastfeeding because they also utilize different rounds of DHS for India and Egypt, respectively. In line with the literature, the TDHS sample verifies that the substantial portion of children above the age of three (i.e., 36-month) are no longer breastfed. In the sample, the number of children who are 36-month-old and above is 1,735 (the number of children below 36-month-old is 3,836 and 51.01% are still breastfed). Yet, only 43 of them are still breastfed – corresponding to 2.47%. Figure 3.1 shows the density of children who are still breastfed at the time of survey with respect to their ages. As can be seen, it is not likely to come across with the event of breastfeeding in and after 36th month of age.

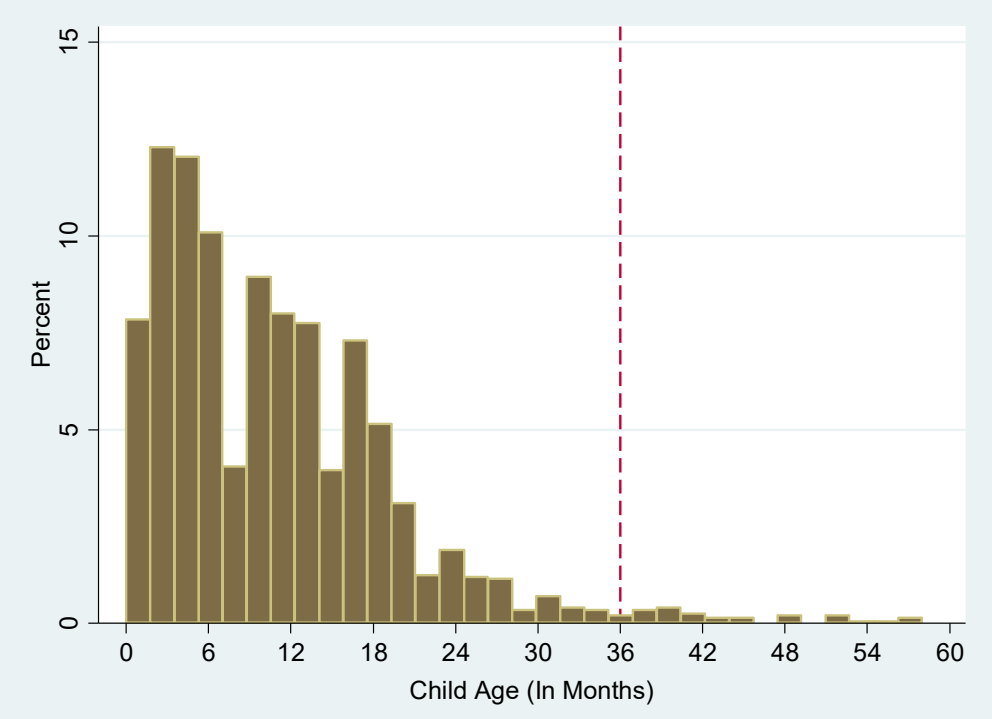

Figure 3. 1. Percent Distribution of Children (Aged 0-59 Months) Still Breastfed

Source: Author's own calculations based on the TDHS-2008 and TDHS-2013.

3.2.1.2. Exclusive Breastfeeding (EBF) Status

The second outcome of interest is "Exclusive Breastfeeding (EBF) Status" which is only defined for the 2008 round of the TDHS as a dichotomous variable. In the TDHS-2008, mothers are directed to the following question: "In which month did you give your child supplementary food for the first time?". The answers are recorded in months. Unfortunately, this question does not appear in the TDHS-2013. In the TDHS-2008, the mean month of the initial supplementary food receipt for children (aged 0-59 months) is 3.07 (SD=3.08) with a minimum of 0 month and a maximum of 36 months. Regarding the information on supplementary food initiation, there are three important issues deserving to be addressed before elaborating how EBF Status variable is constructed. First, the total number of children under five in the TDHS-2008 sample is 2,849. Second, the mean month of the supplementary food receipt is calculated for 2,736 children because we exclude children that are not yet given any solid and/or liquid (whose number is 113). Third, the maximum value representing the month of first supplementary food (i.e., 36th month, where there are only two observations[13]) is in the 99th percentile.

By using the month when a child is first introduced to supplementary food, it is possible to determine whether the children are exclusively breastfed in the first six-month of life. In that respect, the following principle is used when forming the EBF status of the children: it takes the value of 1 if the child is not given supplementary food until his/her 6th month of age (i.e., 6th month is included) and 0 otherwise. It is worth noting that the EBF Status variable covers the children aged 6-59 months because the children below 6-month of age constitute left-truncated observations (i.e., the threshold value of the EBF Status variable is 6th month, and children who did not yet live their first 6 months cannot be accurately

[13] In the dataset, the accuracy of this information is also checked by comparing breastfeeding duration and month of first supplementary food variables. For two children whose mothers report that the first month of supplementary food is 36, the duration of breastfeeding for both is recorded as 36 months. That is, there is no error in reporting. Thus, these two observations are not omitted.

captured by the variable of interest – showing an example of left-truncated data). For this age group (i.e., aged 6-59 months), the data suggest that children receive liquid and/or solid foods in the month of 3.26, on average (SD=3.13). Based on this restriction, the frequency information of EBF Status (Children aged 6-59 months) can be seen in Table 3.1.

Table 3. 1. Frequency of Exclusive Breastfeeding (EBF) Status

EBF Status	Frequency	Percentage (%)
Not Exclusively Breastfed	1722	69.59
Exclusively Breastfed	753	30.41
Total	2475	100.00

Source: Author's own calculations based on the TDHS-2008.

We also provide information on the type of (first) supplementary food that the children were given. In Figure 3.2, the percent distribution of the first supplementary foods can be seen. It appears that plain water (i.e., 34.88%) and baby formula (29.17%) is the most preferred nutrients by the mothers. The other nutrients such as milk (other than breast milk) (i.e., 9.15%), soup/juice of cooked meal (i.e., 6.15%), and yogurt (i.e., 4.03%) constitute the other most-preferred options.

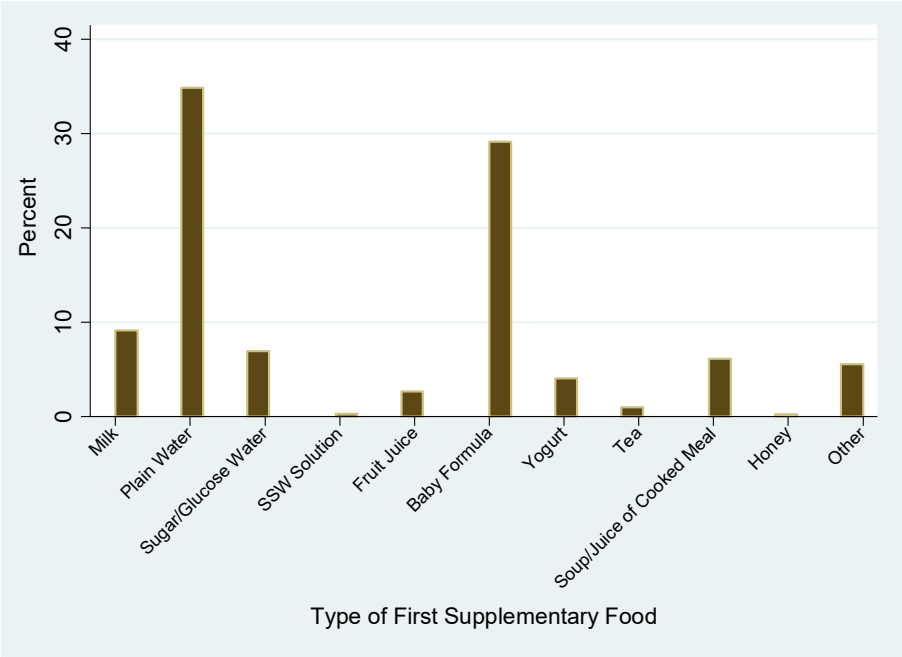

Figure 3. 2. Percent Distribution of Type of First Supplementary Food

Source: Author's own calculations based on the TDHS-2008.
Note: SSW Solution is Sugar-Salt-Water Solution.

3.2.2. Independent Variables

In the empirical analyses, where Breastfeeding Duration and EBF Status as outcome variables, the same set of explanatory variables are utilized. In the literature, the predictors of both variables of interest are -almost- common. The detailed definition of the explanatory variables (e.g., questions directed to mothers and calculation of certain variables) is also given in Appendix Table A.1.

3.2.2.1. Descriptive Statistics for Pooled Sample

Table 3.2 aims to provide information on the explanatory variables. Before discussing the output in Table 3.2, it should be necessary to recall the fact that there is a reference age (i.e., 36-month) that distinguishes on-going and completed breastfeeding. Depending upon this, the descriptive statistics are separately given in Appendix Table A.2 with respect to the reference age. In Table 3.2, it is possible to see all variables (including the dependent variable) used in the regression

models. At this point, it is important to place attention on the independent variables covering child, maternal, household, and regional characteristics.

Our first independent variable is "Survey Year", which only takes two unique values (i.e., 2008 and 2013). The inclusion of this variable enables us to understand whether Breastfeeding Duration changes with respect to five-year period from 2008 to 2013. When it comes to child characteristics, the first variable of interest is Female. It is a binary variable taking value of 1 if the child is Female, and 0 otherwise. As can be seen, Female children constitute 48.0% of the pooled sample. Then, there are two variables that control for birth month and birth year fixed effects. To that extent, "Children's Birth Year" is a discrete variable ranging from 2003 to 2013. To begin with, "Children's Birth Month" is again a discrete variable taking values from 1 (stands for January) to 12 (stands for December). It must be indicated that the children's year of birth and month of birth are added into regression analyses as dummy variables. Our final explanatory variable for children is Birth Weight given in kilograms. Unfortunately, there are 629 missing observations for birth weight variable because mothers do not state their weight of children at birth. Nevertheless, the mean birth weight is found to be 3.21 kilograms (SD=0.67) with a minimum of 0.5 kilograms (in 1st percentile) and a maximum of 6.0 kilograms (99th percentile). In the literature, birth weight is regarded as a significant correlate of the breastfeeding practices and is added into empirical investigations as a categorical variable following WHO's classification (Chaves et al., 2007; Flaherman et al., 2013; Chakravarty, 2015). Therefore, we re-adjust birth weight variable in line with the WHO as follows: 1=Low Birth Weight corresponding to kilograms lower than 2.5 (i.e., 13.05% of the sample); 2=Normal Birth Weight corresponding to kilograms between 25 and 4.0 (i.e., 80.92% of the sample); 3=High Birth Weight corresponding to kilograms more than 4.0 (i.e., 6.02% of the sample).

When it comes to maternal characteristics, the first variable of interest is age. The mean age is 29.44 years with a minimum of 15 and a maximum of 49. Inclusion of maternal age is of great importance because previous research agrees on the fact

that age plays a substantial role in determining breastfeeding practices (Kitano at el., 2015; WHO, 2019; CDC, 2020). Maternal age is included in the regression analyses as a categorical variable following Jayachandran and Kuziemko (2011) and Chakravarty (2015). To that extent, it has seven categories where ages are split in 5-year intervals: 15-19 (=1), 20-24 (=2), 25-29 (=3), 30-34 (=4), 35-39 (=5), 40-44 (=6), and 45-49 (=7). The final mother-related variable is education. Although the empirical analyses are done with the categorical education variable, summary statistics of education (in single years) are also given to provide detailed information. In this regard, Turkish mothers receive 6.12 (SD=4.18) years of education, on average. The categorical education variable indicates the percent distribution of levels as follows: Primary Incomplete or No Education (=1) (i.e., 18.21% of the sample), Complete Primary (=2) (i.e., 42.91% of the sample), Complete Secondary (=3) (i.e., 13.62% of the sample), High School and Higher (=4) (i.e., 25.26% of the sample).

To capture the effect of household characteristics, we consider the following variables. First, in line with the literature, the number of (de facto) household members is included to capture the effect of household size on the length of breastfeeding (Haughton et al., 2010; Tang et al., 2019). It is a continuous variable with a minimum of 1 and a maximum of 15 (99^{th} percentile). The average number of (de facto) adult members is found to be 2.87. Second, number of siblings and their sex composition is previously shown to be powerful factors in determining the duration of nursing (Jayachandran and Kuziemko, 2011; Chakravarty, 2015). Therefore, we first include the number of (older) siblings which is calculated as follows: Mothers' Total Number of Births – 1 (where 1 stand for the last-born children itself). Based on this information, the mean of total (older) siblings is 1.63 (SD=1.85). In addition, the number of children who have no (older) siblings is 1,675 (i.e., corresponding to 30.06% of the sample). Similarly, the number of children having only one brother or sister is 1,911 (i.e., corresponding to 34.32% of the sample). Then, we calculate the male fraction of (older) siblings as follows: Number of (older) male siblings / Total Number of (older) Siblings. Thus, this variable ranges from 0 to 1 and has a mean of 0.362 (SD=0.41). Third, the variable

"Ideal Distance" is first used by Jayachandran and Kuziemko (2011) to measure the distance from ideal family size. Their point of departure in calculating the "Ideal Distance" is the following question directed to mothers "How many child(ren) would you like to have in total if you can go back to days when you have no child(ren)?". The answer to this question is then used to calculate the "Ideal Distance": Ideal Distance = Total Number of Births – Ideal Number of Children Stated by Mother. The graphical illustration of "Ideal Distance" is given in Figure 3.3 to provide a better understanding its nature. Fourth, we consider "Wealth Index" as a proxy for permanent household income that is originally formed by the DHS Program. Detailed information on the construction of "Wealth Index" can be found in Appendix Table A1. Nonetheless, it is a categorical variable from 1 to 5, where 1 indicates the "Poorest" and 5 indicates "Richest" households. In the sample, the percent distribution of households is as follows: 19.75% are in "Poorest", 22.06% are in "Poor", 21.50% are in "Middle", 18.52% are in "Rich", and 18.12% are in "Richest" category. It should be noted that family income is previously revealed to be an important determinant of breastfeeding practices (Heck et al., 2006; Santos et al., 2019).

Finally, residential and regional variables are taken into account. They are expected to provide a crucial insight pertaining to the spatial differences in the healthcare utilization centers throughout Turkey (i.e., family health centers, hospitals, and/or mother and baby friendly hospitals). The literature present evidence that spatial differences in the length of breastfeeding indicating an advantage in North and Northwest and a disadvantage in South in the United States (Ryan et al., 2004; Darling et al., 2005; Kogan et al., 2008). In this vein, Rural is a binary variable where 1 indicates Rural and 0 indicates Urban. As can be seen, 22.50% of the sample reside in Rural while 77.50% lives in Urban. The variable "Five Regions" is a categorical variable which includes West (=1) (i.e., 37.72% of the sample), South (=2) (i.e., 13.29% of the sample), Central (=3) (i.e., 20.45% of the sample), North (=4) (i.e., 5.93% of the sample), and East (=5) (i.e., 22.60% of the sample).

Table 3. 2. Descriptive Statistics for Children Under Five

Variables	Obs	Mean	Std.Dev.	Min	Max
Dependent Variable					
Breastfeeding Duration	5561	12.686	8.901	0	58
Independent Variables					
Survey Year	5571	2010.443	2.5	2008	2013
Child Characteristics					
Female	5571	.48	.5	0	1
Birth Year	5571	2008.605	2.835	2003	2013
Birth Month	5571	6.455	3.332	1	12
Birth Weight (in kilograms)	4942	3.21	.673	.5	6
Birth Weight (Category)	4942	1.92	.431	1	3
Mother Characteristics					
Age (in years)	5571	29.44	5.922	15	49
Age (interval)	5571	3.514	1.191	1	7
Education (in years)	5571	6.129	4.183	0	21
Education (Level)	5571	2.459	1.057	1	4
Household Characteristics					
De Facto # of Members	5571	2.876	1.544	1	15
Total # of (Older) Siblings	5571	1.638	1.85	0	14
Male Fraction of (Older) Siblings	5571	.362	.415	0	1
Distance from Ideal Family Size	5511	-.208	1.838	-12	13
Wealth Index	5571	2.655	1.375	1	5
Regional Characteristics					
Rural	5571	.225	.418	0	1
Five Regions	5571	3.311	1.556	1	5

Source: Author's own calculations based on TDHS-2008 and TDHS-2013.
Notes: Sample weights are taken into account in the construction of this table.

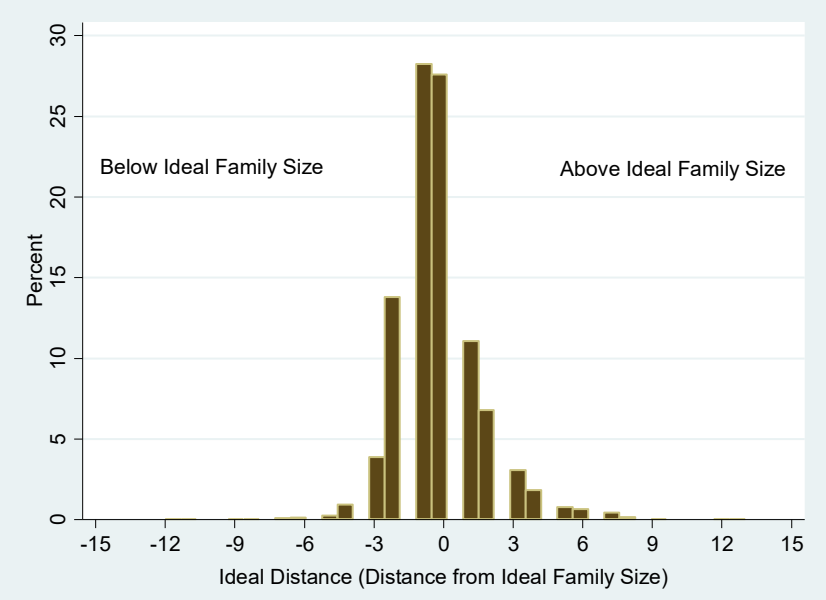

Figure 3. 3. Percent Distribution of Distance from Ideal Family Size

Source: Author's own calculations based on TDHS-2008 and TDHS-2013.

3.2.2.2. Descriptive Statistics for TDHS-2008

As stated above, the independent variables used for the TDHS-2008 sample is the same as the pooled sample. In that respect, Table 3.3 is given to describe the independent variables. However, it should be noted that Table 3.3 covers the children aged above 6-month of age to be used in the empirical analyses. Nevertheless, Appendix Table A.3 divides the sample (i.e., children aged 6-59 months) by their EBF Status to provide detailed information between two groups based on means and corresponding standard deviations.

On average, the proportion of children (i.e., children aged 6-59 months) who are exclusively breastfed for the first six months of life is 30.41% (SD=.46). To begin with, Female children constitute 48.20% of the sample. Using the same rationale as above, children's birth year and birth month are added as fixed effects to understand potential effects by (birth) year and month. For the TDHS-2008 sample, children's year of birth has a minimum of 2003 and a maximum of 2008. Furthermore, the birth weight of children is recorded to be 3.22 kilograms on

average. To that extent, majority of children (78.75%) are found to be born in normal-birth-weight. Nevertheless, low- and high-birth-weight children are much less observed in the sample (14.35% and 6.90%, respectively).

All mothers in the sample are between the reproductive age interval (i.e., 15-49). The mean age is found to be 29.26 years (SD=5.97). When it comes to mothers' schooling, it appears that mothers receive 5.59 years of education on average. Based on the levels, the percent distribution of mothers are as follows: 19.13% of them are primary school dropouts or lack of formal education, 50.23% of them are primary school graduates, 9.40% of them obtained secondary school diploma, and 21.24% of them participated in higher school and/or tertiary education.

In the households, the number of (de facto) persons are 2.89 on average with a minimum of 1 and a maximum of 15 (99^{th} percentile). It must be noted that the number of (de facto) persons only consider the adults. That is, individuals above in and above the age of 18 are included. Moreover, the mean number of older siblings that the last-born children is 1.71 (SD=1.95). To be more precise, it would be beneficial to indicate that 31.53% of children have neither (older) brother nor sisters while 32.28% of them has one and 16.83% of them has two (older) siblings. As a sibling sex composition indicator, the mean fraction of (older) male siblings turns out to be 36.0% (SD=.41). For wealth index, it has a mean of 2.657, where the percent distribution of categories is given as follows: 20.43% (i.e., the Poorest), 22.44% (i.e., Poorer), 21.53% (i.e., Middle), 18.06% (i.e., Rich), and 17.53% (i.e., the Richest).

Finally, the regional characteristics suggest that the 29.60% of the children reside in rural at the time of survey. When considering the five regions of Turkey, children living in West constitute 37.01% and it is followed by Central (22.13%), East (21.82%), South (12.99%), and North (6.06%), respectively.

Table 3. 3. Descriptive Statistics for the TDHS-2008 (Children Aged 6-59 Months)

Variable	Obs	Mean	Std.Dev.	Min	Max
Dependent Variable					
EBF Status	2475	.304	.461	0	1
Independent Variables					
Child Characteristics					
Female	2475	.482	.5	0	1
Birth Year	2475	2005.94	1.301	2003	2008
Birth Month	2475	6.272	3.499	1	12
Birth Weight (in kilograms)	2029	3.227	.718	.6	6
Birth Weight (Category)	2029	1.925	.481	1	3
Mother Characteristics					
Age (in years)	2475	29.266	5.976	15	49
Age (interval)	2475	3.455	1.228	1	7
Education (in years)	2475	5.597	3.978	0	19
Education (Level)	2475	2.327	1.014	1	4
Household Characteristics					
De Facto # of Members	2475	2.899	1.585	1	15
Total # of (Older) Siblings	2475	1.705	1.952	0	14
Male Fraction of (Older) Siblings	2475	.360	.410	0	1
Distance from Ideal Fertility	2440	-.086	1.746	-11	12
Wealth Index	2475	2.657	1.37	1	5
Regional Characteristics					
Rural	2475	.296	.457	0	1
Five Regions	2475	3.335	1.556	1	5

Source: Author's own calculations based on the TDHS-2008.
Notes: This table cover children aged 6-59 months. Sample weights are taken into account.

3.3. Right-Censoring

As previously emphasized, the breastfeeding duration is a right-censored variable given its nature. In statistics, the censoring is a matter of interest when it comes to survival analysis. In survival analysis, each individual i (or subject) is monitored until an event (i.e., failure) occurs within a specified time interval (or study time). Researchers are interested in how long the subjects stay in the sample (i.e., survival). At the same time, the risk of failure (i.e., hazard rate) is another crucial concept that shows the likelihood that the event happens at a given time.

Nonetheless, it is highly likely to lose the subjects from the sample (i.e., known as censored subjects) due to following reasons each of which constitutes an example of the right-censoring.

(i) The event is not yet experienced by the subject although the study is not over. However, it is not known when and/or whether the subject experiences the event.
(ii) The subject is lost to follow-up during the study's time-period.
(iii) The subject abandons the study because of an unobservable factor.

The situation of censoring can be formulated as follows:
X = The event variable occurring within a specified time interval.
C_r = Censoring time.
T = Time variable, which represents the length of time until the event is experienced by the subject.
Y = Duration, which is referred as time-to-event variable.

The time-to-event variable is usually denoted by (T,δ) where δ is the indicator of censoring. In particular, $\delta = 1$ if $T = X$ and $\delta = 0$ if $T=C_r$. It is crucial to include the subjects that are censored since the fact that these subjects are not yet encounter the failure have a significant effect on the duration analysis.

3.4. Rationale of Survival Analysis

3.4.1. Breastfeeding

In the TDHS sample, the above-mentioned setting can be considered as follows. First, the event variable (i.e., failure) that stands for "being weaned" at any month from 0 to 58. Second, the time variable is the age in months (i.e., the start time is

0^{th} month and the end time is 58^{th} month[14]). The time-to-event variable is "Breastfeeding", which is a combination of time and failure. Yet, it indeed is right-censored due to the presence of children (i.e., subjects) who are still breastfed. In other words, it is not possible to interpret when the still breastfed children are going to experience the failure (namely, it is unclear that when will they stop receiving breast milk). Nevertheless, it should be noted that the children, who have already experienced the failure, require no censoring as their exact survival time is recognized. Since the rationale of the survival analysis is now apparent, it would be beneficial to discuss the way that this thesis uses to tackle right-censoring. Given the cross-sectional nature of the TDHS, the child i is observed once. To include right-censored observations in the empirical investigation, we convert the nature of our dataset from cross-sectional to longitudinal form using the Case Identification Number, conditional on age (in months). By doing this, we have longitudinal (monthly) data spanning from month 0 (corresponding to birth of the child) to 59 or the current age of the child if the child is below age of 5. Therefore, the child i can be retrospectively observed for each month of age starting from birth month (i.e., month 0).

To sum up, the time-to-event variable (i.e., the dependent variable in longitudinal data) is Breastfeeding which is an indicator variable. It takes the value of 1 for all the months that the child is reported to be breastfed, and 0 for all the succeeding months that the child is reported to be weaned. Since children are retrospectively observed in the longitudinal data, the number of records is found to be 79,735. Regarding the time variable, the first entry time is month of birth (i.e., month 0) and the final exit time is month 58 (i.e., the maximum value of breastfeeding reported by mothers), or the month in which the child is weaned, whichever comes earlier. The mean of exit time is estimated as 13.81 months. Finally, the number of subjects who experience the failure (i.e., weaning) is 3,514 out of 5,561 subjects.

[14] Note that the maximum response to the question *"How many months did you breastfeed your child?"* is 58-month.

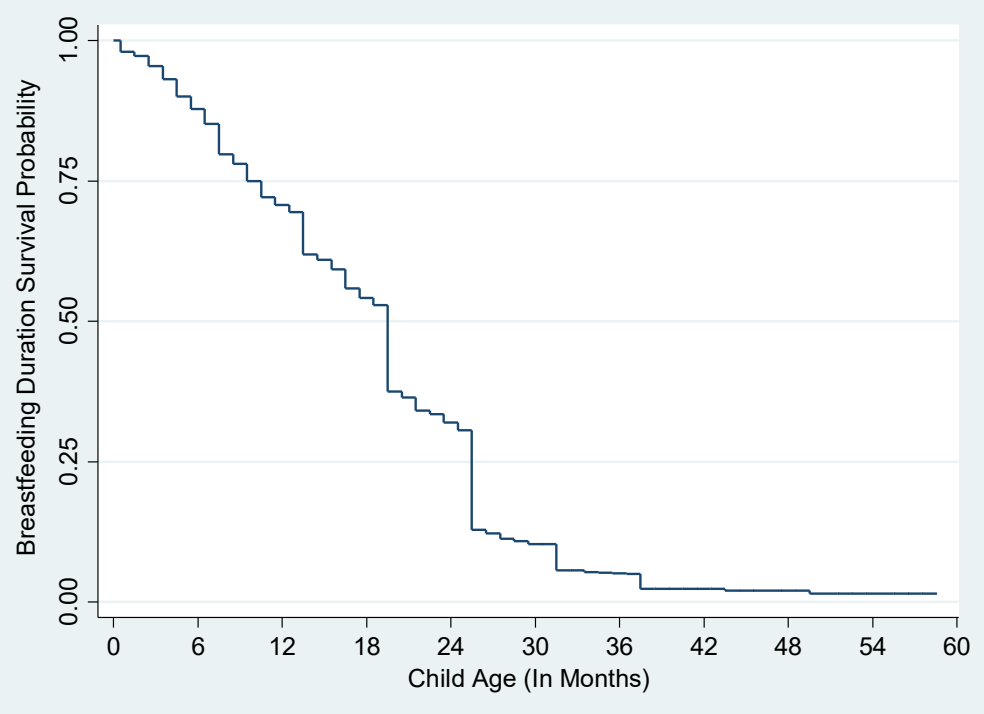

Figure 3. 4. Kaplan-Meier Survival Estimate for Breastfeeding

Source: Author's own calculations based on the TDHS-2008 and TDHS-2013.

In Figure 3.4, Kaplan-Meier Survival Estimate for "Breastfeeding" variable is shown for the children under five years of age. It can be clearly seen that as children grow up, they are less likely to receive breast milk – implying that they are more likely to experience the failure (i.e., weaning) as their age increases. Note that Kaplan-Meier survival function is a decreasing step function with a jump at each failure time – when there is no censoring (Wooldridge, 2007). The changing patterns in "Breastfeeding" by sex and survey years are also depicted in Figure 3.5 – implying a male advantage and a promising improvement across years, respectively. The Wald test (i.e., test for equality of survival functions between two groups) is also performed to see whether the differences across two groups (i.e., sex and survey years) are statistically significant. The results indicate that "Breastfeeding" differs across sexes ($p<.000$) and years ($p<.000$) at 5% level of significance.

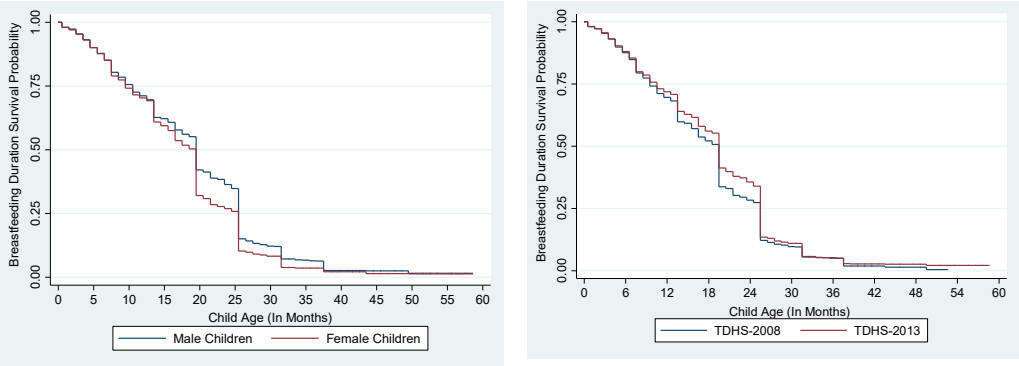

Figure 3. 5. Kaplan-Meier Survival Estimates by Sex and Year (Breastfeeding)

Source: Author's own calculations based on the TDHS2008 and TDHS-2013.

3.4.2. Exclusive Breastfeeding (EBF)

Using the same rationale as above, we again generate a longitudinal monthly data spanning from month 0 (marking the birth month of the child) to month of 59. As mentioned earlier, the TDHS-2008 provides information on the month in which the child is first given the supplementary food. To that extent, we create an indicator variable "Exclusive Breastfeeding (EBF)" that takes the value of 1 for all months that the child is reported to be exclusively breastfed and 0 starting from the month that the child is first reported to be given liquids and/or solids. To that extent, the time variable is month of first supplementary food which covers all children under five. The failure (or event) variable is "being given supplementary food". Thus, our dependent variable "Exclusive Breastfeeding (EBF)" is a combination of time and failure. To present the survival of children (i.e., being exclusively breastfed or being not yet given any supplementary food), Figure 3.6 is also given. It simply implies that the likelihood of surviving decreases within (study) time.

In sum, the number of records in the (longitudinal) sample of TDHS-2008 is 11,681. For the time variable, the first entry time (i.e., the time when the children are first introduced to the supplementary food) is month 0, and the exit time is month 36 (i.e., the latest month that the children are reported to be given

supplementary food for the first time), or the month in which the child is given supplementary food, whichever comes earlier. The mean exit time is 3.61 months. The number of subjects who experience the failure (i.e., being given supplementary food) is 2,725 out of 2,848 subjects.

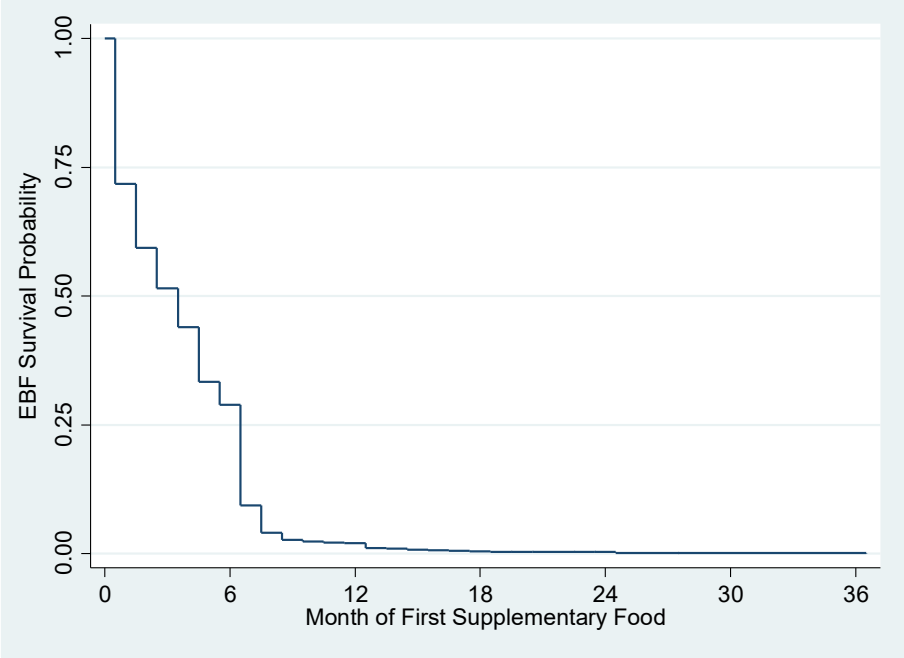

Figure 3. 6. Kaplan-Meier Survival Estimate for the EBF

Source: Author's own calculations based on the TDHS-2008.

According to Figure 3.7, it appears that there is no gender gap in the Exclusive Breastfeeding (EBF), while it turns out to be different when it comes to type of place of residence. To statistically capture the between-group differences, the Wald test is also conducted for the sex and the type of place of residence. In the same line with the Figure 4.1, the Wald test shows that the Exclusive Breastfeeding (EBF) does not differ by sex (p=.4793) at any reasonable level of significance. Finally, Exclusive Breastfeeding (EBF) is found to be different by rural/urban residence (p=.0085).

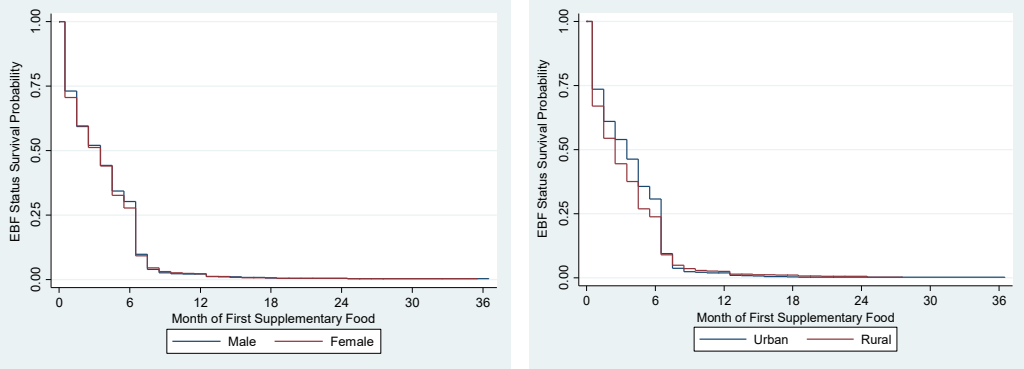

Figure 3. 7. Kaplan-Meier Survival Estimate by Sex and Residence (EBF)

Source: Author's own calculations based on the TDHS-2008.

CHAPTER 4

METHODOLOGY

4.1. Empirical Strategy for Cross Sectional Data

4.1.1. Breastfeeding Duration (Children Above 36-Month)

To analyze the determinants of the Breastfeeding Duration of 3-5-year-olds, this thesis makes use of the Ordinary Least Square (OLS) regressions. The OLS model is an accurate choice in the current setting because the outcome variable (i.e., Breastfeeding Duration) has a continuous nature. Besides, all independent variables are assumed to be exogenous. By using the OLS model, it is possible to estimate the change in the breastfeeding duration when a one-unit change takes place in each explanatory variable(s). In this respect, Equation (1) to be estimated by the OLS is as follows:

$$\begin{aligned} BDF_i = {} & \alpha_0 + \alpha_1 \mathbf{Year_i} + \alpha_2 \mathbf{Female_i} + \sum_{j=2}^{4} \alpha_{3j} \left(\mathbf{BWeight_{ij}}\right) + \sum_{j=2}^{7} \alpha_{4j} \left(\mathbf{MAge_{ij}}\right) \\ & + \sum_{j=2}^{4} \alpha_{5j} \left(\mathbf{MEdu_{ij}}\right) + \alpha_6 \mathbf{HHMember_i} + \alpha_7 \mathbf{Sibling_i} + \alpha_8 \mathbf{MaleFrac_i} + \alpha_9 \mathbf{Ideal_i} \\ & + \sum_{j=2}^{5} \alpha_{10j} \left(\mathbf{WealthIndex_{ij}}\right) + \alpha_{11} \mathbf{Rural_i} + \sum_{j=2}^{5} \alpha_{12j} \left(\mathbf{Region_{ij}}\right) + \alpha_{13} \mathbf{Y}_i \\ & + \varepsilon_i \end{aligned} \tag{1}$$

where the dependent variable is BFD_i indicating the number of months a mother reports having breastfed her last-born child i. $\mathbf{Year_i}$ stands for the survey year to control for time year effect. It is an indicator variable taking value of 1 for 2013

and 0, otherwise. Any survey year difference in nursing duration is captured by coefficient α_i. **Female$_i$** is a dummy variable taking the value of 1 when the child is a girl, and 0 otherwise. **BWeight$_{ij}$** is categorical variable denoting whether the child i born with birth-weight j (i.e., j spans from 1 to 4 where 1=low; 2=normal; 3=high-birth-weight; 4=missing-birth-weight). The children of low-birth-weight is the reference category. Thus, for example, the regression coefficient of normal-birth-weight shows the effect of being born in normal-birth-weight as compared to being born in low-birth-weight on breastfeeding duration.

In a similar manner, **MAge$_{ij}$** is maternal age. It has a categorical nature indicating whether mother i is in age interval j (where j stands for five-year intervals from 1 to 7 such that 1=15-19, 2=20-24, …, 7=44-49). For maternal age, our reference category is women whose age is between 15-19. Furthermore, to estimate effect of maternal education on breastfeeding duration, we include education level of mother denoted by **MEdu$_{ij}$** as a categorical variable. It shows for whether the mother i is in education level j at the time of survey (i.e., j ranges from 1 to 4 as follows: 1=No education/Primary Incomplete, 2=Primary Complete, 3=Secondary Complete, and 4=High School and Higher). It should be noted that the base category is "No Education/Primary Incomplete".

The variables related to household characteristics are as follows. First, **HHMember$_i$** is a continuous variable and corresponds to the number of (de facto) household members who are aged 18 and above in the household. Thus, the coefficient α_6 is expected to capture the effect of one additional adult person in the household on the length of nursing. Then, we add the number of older siblings denoted by **Sibling$_i$** to understand the impact of sibship size (of older siblings) on breastfeeding duration. It worth noting that **Sibling$_i$** is a continuous variable. In addition, male fraction of older siblings (i.e., **MaleFrac$_i$** taking values between 0 and 1) aims to address the effect of sibling sex composition whose effect to be captured by α_8. Also, **Ideal$_i$** measures the distance from ideal family size and spans from -12 to 13. That is, the effect of each birth that brings the family to its ideal

size is captured by α_9. Besides, $\mathbf{WealthIndex_{ij}}$ is a proxy for the mother i's permanent income level residing in household j. It is a categorical variable where categories are represented by j(s) (i.e., 1=Poorest; 2=Poorer; 3= Middle; 4=Rich; 5=Richest). The base category is "Poorest".

Moreover, $\mathbf{Rural_i}$ is a binary measure of type of place of residence where 1 refers to Rural and 0 implies Urban. Any difference in breastfeeding duration with respect to five regions of Turkey is captured by the regression coefficient(s) α_{11j}. In this vein, $\mathbf{Region_{ij}}$ has a categorical nature where j ranges from 1 to 5 (i.e., 1= West, South= 2, Central= 3, North= 4, and East= 5). The fixed effects, shown by γ_i, are children's birth year and birth month, each of which are included in the regressions as dummy variables (i.e., year-of-birth and month-of-birth dummies). Finally, $\in_i$ represents the idiosyncratic error term. It must be noted that the bases for dummy and/categorical variables are also given in the tables where regression results are presented.

4.1.2. Exclusive Breastfeeding Status (Children Aged 6-59 Months)

The EBF Status is defined for children above the age of six-month. It is necessary to recall that it is a binary measure of being exclusively breastfed for the first six-month of life. It takes the value of 1 if the children are not given supplementary food until 6th month of age, and 0 otherwise. In the presence of a dichotomous dependent variable, the most widespread method is to utilize Linear Probability Model (LPM) models. Before presenting the model for the EBF Status, the general setting of the LPM must be provided to understand its rationale. The theoretical formulation of the LPM is given by following Wooldridge (2015). First, consider a multiple linear regression model as in Equation (2) where the outcome variable y is assumed to be binary.

$$y=\beta_0+\beta_1 x_1+\beta_2 x_2+\ldots+\beta_k x_k+u \quad (2)$$

Since the dependent variable (i.e., y) can only take two values (i.e., zero and one), it would not be true to interpret β_j as the change in y given a one-unit change in x_j – when all other factors are held constant. Instead, y can change from 0 to 1 or vice versa (or does not change). Nonetheless, β_j can still be interpreted in a useful manner assuming that the zero-conditional mean assumption holds. In other words, the unobservable disturbance term (u) has an expected value of 0 given any values of the explanatory variables (i.e., $E(u|x_1, \dots, x_k) = 0$). If one presumes that the assumption is not violated, then the conditional expectation of y given x is the following linear expression shown in Equation (2.1):

$$E(y|x)=\beta_0+\beta_1 x_1+\beta_2 x_2+\dots+\beta_k x_k \quad (2.1)$$

The important fact here is that as long as y has a dichotomous nature, it is always valid that the probability of y = 1 is equal to the expected value of y (i.e., $Pr(y = 1 |x) = E(y|x)$). Depending on this, Equation (2.1) can be re-written as follows.

$$Pr(y=1 |x) =\beta_0+\beta_1 x_1+\beta_2 x_2+\dots+\beta_k x_k \quad (2.2)$$

Equation (2.2) implies that the probability of being exclusively breastfed in the first six month of life (or success) (i.e., $Pr(y = 1 |x)$) given all the explanatory variables is equal to the linear function of the explanatory variables. Therefore, the multiple linear regression model where the response variable is dichotomous is named as LPM. In other words, the probability is linear in the parameter β_j. When it comes to interpretation, it can be said that β_j measures the changes in the probability of being exclusively breastfed when x_j changes (when all other factors are held constant):

$$\Delta Pr(y=1 |x)=\beta_j \Delta x_j \quad (2.3)$$

Having defined the principles of the LPM, the estimated equation for the EBF Status can be stated as follows:

$$\widehat{EBF_i} = \hat{\beta}_0 + \hat{\beta}_1 \mathbf{Female_i} + \sum_{j=2}^{4} \hat{\beta}_{2j} \left(\mathbf{BWeight_{ij}}\right) + \sum_{j=2}^{7} \hat{\beta}_{3j} \left(\mathbf{MAge_{ij}}\right)$$
$$+ \sum_{j=2}^{4} \hat{\beta}_{4j} \left(\mathbf{MEdu_{ij}}\right) + \hat{\beta}_5 \mathbf{HHMember_i} + \hat{\beta}_6 \mathbf{Sibling_i} + \hat{\beta}_7 \mathbf{MaleFrac_i} + \hat{\beta}_8 \mathbf{Ideal_i}$$
$$+ \sum_{j=2}^{5} \hat{\beta}_{9j} \left(\mathbf{WealthIndex_{ij}}\right) + \hat{\beta}_{10} \mathbf{Rural_i} + \sum_{j=2}^{5} \hat{\beta}_{11j} \left(\mathbf{Region_{ij}}\right)$$
$$+ \hat{\beta}_{12} \mathbf{Y_i} \qquad (3)$$

where $\widehat{\mathbf{EBF_i}}$ is the predicted probability of being exclusively breastfed in the first six months of life. The set of explanatory variables, except for survey year, are the same as the previous model. $\widehat{\boldsymbol{\beta}_0}$ shows the predicted probability of being exclusively breastfed when all other explanatory set of variables are zero. In that respect, $\widehat{\boldsymbol{\beta}_j}$ implies the predicted change in the probability of being exclusively breastfed as x_j changes by one unit.

4.2. Empirical Strategy for Longitudinal Data

4.2.1. Breastfeeding

As mentioned before, the time-to-event variable (or namely dependent variable) is "Breastfeeding" which has dichotomous nature. In the longitudinal data where children are retrospectively observed, "Breastfeeding" variable takes the value of 1 for all the months that the child is reported to be nursed and 0 otherwise. Following this information, we present the theoretical formulation of survival analysis. It should be noted that the theoretical formulations come from Wooldridge (2007), Katchova (2013) and Dinterman and Katchova (2020).

i. The dependent variable is presumed to have a continuous probability distribution f(t).

ii. The probability that the duration time (i.e., it is denoted by T which represents the duration that child i continue to receive breast milk) will be less than t is (i.e., t is the unique cut-off age for each child. It shows the age that the child i is weaned). Alternatively, this corresponds to the probability of failure.

$$F(t)= Pr(T\leq t) = \int_0^t f(s)ds \quad (4)$$

iii. The survival function denoted by s(t) (i.e., each month that the child i continue to receive breast milk) is the probability that the duration will be at least t. Alternatively, it shows the probability of survival being greater than that cut-off age.

$$s(t)=1- F(t)= Pr\ (T\geq t) \quad (4.1)$$

iv. Finally, the hazard rate represents the likelihood that the child i will experience the failure at time t while this child is at risk for experiencing the failure. To that extent, the Equation (4.2) shows that the hazard rate is the probability that the duration will end after time t, given that it has lasted until time t:

$$\lambda(t)=\frac{f(t)}{S(t)} \quad (4.2)$$

When it comes to empirical investigation, number of modelling options for the survival function exists. The first includes non-parametric models such as the Nelson Aalen estimator of the cumulative hazard function and the Kaplan-Meier estimator of the survival function that are not able to capture the effects of

explanatory variables. The second covers semi-parametric models such as the Cox Proportional Hazard Model. The final option is the parametric models such as Exponential and Weibull Distribution. In thesis, using non-parametric models is inappropriate because it is not possible to include independent predictors. Therefore, non-parametric models are only practical for descriptive purposes (Adelian et al., 2015; Mokarram et al., 2016). As opposed to the non-parametric models, the effects of covariates can be analyzed using parametric and semi-parametric models. However, the advantages of the semi-parametric models outweigh the benefits of the parametric models because it is not necessary to specify baseline hazard function in the semi-parametric models. (Cox and Oakes, 1984; Singh and Mukhopadhyay, 2011).

Among the semi-parametric models, the Cox Model is the most used one in many fields including clinical trials and duration analyses for which the response variable of interest is time until an event takes place. Perhaps the most crucial assumption of the Cox Model is that the hazard functions are proportional (Cox, 1972; Cox and Oakes, 1984). In other words, the model presumes that each independent variable has a multiplicative effect (or additive) in the hazards function that is constant over time. Our analyses are carried out using Cox Regressions.

Considering its flexibility, this thesis model the survival function by using the Cox Model- which was put forward by D. R. Cox in 1972. In this vein, the hazard rate in the Cox Model can be defined as follows:

$$\lambda(t|\mathbf{x},\beta)=\lambda_0(t)\exp(\mathbf{x}'\beta) \quad (4.3)$$

Finally, this thesis estimates the following proportional hazard model for Breastfeeding without placing conditions on the baseline hazard function and models the explanatory variables as having a proportional impact on the hazard rate:

$$\lambda(t|\mathbf{X_i})=\lambda_0(t)*\exp(\delta_1\mathbf{Year}_i + \delta_2\mathbf{Female_i} + \sum_{j=2}^{4}\delta_{3j}(\mathbf{BWeight_{ij}})$$

$$+ \sum_{j=2}^{7}\delta_{4j}(\mathbf{MAge_{ij}})+ \sum_{j=2}^{4}\delta_{5j}(\mathbf{MEdu_{ij}}) + \delta_6\mathbf{HHMember_i} + \delta_7\mathbf{Sibling_i}$$

$$+ \delta_8\mathbf{MaleFrac_i} + \delta_9\mathbf{Ideal_i}$$

$$+ \sum_{j=2}^{5}\delta_{10j}(\mathbf{WealthIndex_{ij}})+ \delta_{11}\mathbf{Rural_i}+ \sum_{j=2}^{5}\delta_{12j}(\mathbf{Region_{ij}}) +\delta_{13}\mathbf{Y_i}+e_i) \qquad (4.4)$$

4.2.2. Exclusive Breastfeeding (EBF)

The same rationale is valid for the "Exclusive Breastfeeding (EBF)" variable. In the longitudinal data, the time-to-event variable (or dependent variable) is "Exclusive Breastfeeding (EBF)", which is an indicator variable constructed as follows. The TDHS-2008 provides information on the month in which the child is first introduced to supplementary food. Relying on this information, EBF is replaced with 1 for all months that the child is not given supplementary food, and 0 otherwise. As discussed earlier, the failure is "being given supplementary food". The model for the EBF is given as follows:

$$\lambda(t|\mathbf{X_i})=\lambda_0(t)*\exp(\theta_1\mathbf{Female_i} + \sum_{j=2}^{4}\theta_{2j}(\mathbf{BWeight_{ij}})$$

$$+ \sum_{j=2}^{7}\theta_{3j}(\mathbf{MAge_{ij}})+ \sum_{j=2}^{4}\theta_{4j}(\mathbf{MEdu_{ij}}) + \theta_5\mathbf{HHMember_i} + \theta_6\mathbf{Sibling_i}$$

$$+ \theta_7\mathbf{MaleFrac_i} + \theta_8\mathbf{Ideal_i}$$

$$+ \sum_{j=2}^{5}\theta_{9j}(\mathbf{WealthIndex_{ij}})+ \theta_{10}\mathbf{Rural_i}+ \sum_{j=2}^{5}\theta_{11j}(\mathbf{Region_{ij}}) +\theta_{12}\mathbf{Y_i}+u_i) \qquad (5)$$

CHAPTER 5

RESULTS

5.1. Breastfeeding Duration

5.1.1. Breastfeeding Duration (Cross-sectional Data)

One of the aims of this thesis is to explore the correlates of breastfeeding duration among children. For this purpose, we consider children aged 3 to 5, the overwhelming majority of whom are no longer nursed at the time of survey. Thus, Breastfeeding Duration covers children of 3-5 ages. To that extent, Equation (1) is estimated using OLS model and the results are given in Table 5.1. The results suggest that the duration of breastfeeding does not differ across survey years. Namely, as compared to the TDHS-2008, children in the TDHS-2013 round do not have a different duration of nursing.

The results on the effect of gender on breastfeeding duration imply a male advantage. That is, the duration of breastfeeding for female children is 1.12 months less than that of male children. In the literature, findings on the gender gap in breastfeeding are mixed and have an interesting aspect. While studies documenting a son-favoring evidence come from middle- and low-income countries (e.g., Fledderjohann et al., 2014 -for India), female-favoring ones come from high-income countries (e.g., Scott et al., 2007 -for Australia). Our results on the female nutritional disadvantage are in line with Jayachandran and Kuziemko (2011) and Chakravarty (2015) who also find son-favoring results for Indian and Egyptian contexts, respectively. Their findings are of great importance since the dataset utilized in their studies are also coming from the DHS. For the Turkish context, our findings are the first showing male bias in breastfeeding duration.

When it comes to birth weight of children, children with normal (i.e., between 2.5 and 4.0 kilograms) and high birth weights (i.e., more than 4.0 kilograms) are breastfed longer than those with low-birth-weight. On average, the normal-birth-weight children are nursed 2.39 months longer than low-birth-weight children (high-birth-weight children are nursed 2.61 months longer than low-birth-weight children). The literature also suggests that birth weight is a robust and a positive correlate of nursing length (Chaves et al., 2007; Flaherman et al., 2013; WHO, 2019). The nutritional disadvantage of LWB babies (as measured by breastfeeding duration) stems from the fact that they have a greater tendency to be hospitalized due to higher chances of developing life-threatening neonatal illnesses seen within the 4 weeks after delivery (e.g., pneumonia and/or diarrhea) (Gill et al., 2013). Any interruption in breastfeeding (during neonatal period) caused by hospitalization significantly reduces the milk supply of mothers and increases the likelihood of being given infant formula (WHO, 2006). In turn, the LWB newborns are less likely to experience prolonged breastfeeding. Yet, children with normal-birth-weight (and high-birth-weight) generally do not encounter such fatal neonatal diseases resulting in incubation and/or hospitalization. Besides, one should keep in mind that the reflex of sucking is found to be less-developed among the LWB children than the NBW and HBW children (Yeşinel, 2007). Thus, they have greater chance to be nursed longer (Chaves et al., 2007; Flaherman et al., 2013; WHO, 2019).

On the other hand, maternal characteristics seem to have a lower explanatory power on how long children are breastfed. First, except for the positive impact seen for mothers aged between 35-39 years, mother's age does not change the breastfeeding length. Even though the empirical findings on effect of maternal age on nursing length is far from being conclusive, our results support the previous evidence from other countries indicating that advanced maternal age (i.e., 35 and higher) extends the breastfeeding duration (Kaneko et al., 2006; Hauck et al., 2011; Liu et al., 2013).

For maternal education, we do not find any evidence. Using the same rounds of the TDHS, Usta (2020) explores the (causal) effect of maternal schooling on breastfeeding duration for different age groups (i.e., 36-month and 48-month children). She does not find any evidence supporting the view that maternal schooling matters for breastfeeding duration. Likewise, Şencan, Tekin, and Tatlı (2013)[15] find no correlation between mother's educational attainment and breastfeeding duration. Apart from the Turkish context, the literature presents mixed evidence. For instance, Colodro-Conde et al. (2011) conducts a study where they analyze the association between maternal schooling and breastfeeding length in Spain. They collect data from almost 660 mothers whose children were born between 1958 and 2002. Their study yields interesting findings as they show that the effect of mother's education differs significantly as time passes. While it is found to be a negative factor at some point in time (e.g., 1970s), the results after a three-decade period suggest the opposite (i.e., early 2000s). In sum, the authors conclude that mother's schooling is not related to length of nursing in the same direction across years. Chen et al. (2019), however, report that Chinese mothers with high school and/or higher education are more likely to stop breastfeeding earlier than those who are less-educated. They attribute their results to incompatibility of work and life balance of mothers with higher schooling.

Furthermore, some household characteristics appear to be significant correlates of the duration that children are breastfed. These include the number of (de facto) adults, total number of (older) siblings, and ideal family size. Regarding the number of (de facto)[16] adult household members, it can be said that each additional person in the house contributes to breastfeeding duration by 0.59 months. Similarly, the number of older siblings of the child has a positive and a statistically significant effect (i.e., 1.10 months on average) as previously highlighted by

[15] It must be noted that their sample is not nationally representative. They prepare a survey including 32 questions. The questions are asked to mother whose children are previously patients in the Ankara Numune Hospital's Pediatric Outpatient Clinic.

[16] The results are robust to the use of number of de jure household members instead of de facto household members.

Jayachandran and Kuziemko (2011). In their empirical investigations, Jayachandran and Kuziemko (2011) and Chakravarty (2015) document that the male fraction of older siblings extends the duration of breastfeeding. Yet, we do not find a significant effect.

Moreover, the effect of each additional birth that brings the family size closer to ideal size (as measured by ideal distance) shortens children's nursing duration by 0.46-month on average. The variable, ideal distance, is originally generated by Jayachandran and Kuziemko (2011) and their results for Indian babies are not in line with our results. Their hypothesis for the positive impact of "ideal distance" is as follows. Mothers prefer to cease nursing until they hit their ideal family size. The reason behind is that nursing prevents women from getting pregnant. In turn, women's choice of early termination of nursing relies on the fact that breastfeeding inhibits fecundity. In sum, since one additional childbirth reduces the desire of getting pregnant again, it results in an increased breastfeeding duration (for Indian case). Yet, it seems that Turkish mothers do not have such a fertility preference which in turn affects their breastfeeding decisions in a positive manner.

In line with the earlier research, we find a negative and a statistically significant effect of household income (proxied by wealth index) (Ajami et al., 2018). To be more precise, children residing in "Poorer", "Rich" and the "Richest" households seem to be weaned earlier than children residing in the "Poorest" households. Our results are consistent with the findings of UNICEF (2018) stating that in middle-income countries, children from wealthier households are less likely to experience extended breastfeeding. The early termination of breastfeeding for children residing in the "Rich" and the "Richest" households may be attributable to the fact that mothers might not have any financial hurdles to buy infant formula/milk. Alternatively, they are more likely to be in the labor force so that they cannot spend enough time to nurse their offspring – which makes infant formula and/or other supplementary food appealing. Yet, mothers in the "Poorest" households (i.e., the reference category) may prefer to practice prolonged breastfeeding just because it is cost-free and healthy.

Regarding the residential and regional differences, this thesis finds no evidence that the breastfeeding duration changes by rural/urban residence. In fact, earlier research presents mixed evidence showing a rural/urban difference. For example, Kintner (1985) concludes that breastfeeding duration is shorter in urban areas in Germany. In contrast, some studies reveal an urban advantage for countries including Nigeria and India (Adewuyi et al., 2017; Senanayake et al., 2019). Nonetheless, the length of breastfeeding appears to vary with respect to five regions of Turkey. That is, children living in South and North are disadvantaged than those living in West and consume breast milk 1.86 and 2.25 months less, respectively. Our results support the existing evidence showing that living in South is detrimental for breastfeeding duration (Ryan et al., 2004; Kogan et al., 2008). Finally, even though the effects of birth-of-month and birth-of-year dummies (used as FEs) are not shown in Table 5.1, it must be indicated that our results do not provide an evidence that birth-month or birth-year (dummies) does create a difference in the length of breastfeeding (see Appendix Table A.4). Our results are in line with Jayachandran and Kuziemko (2011) and Chakravarty (2015) who also use the same FEs in their analyses but fail to find a significant effect.

Table 5. 1. OLS Results on Breastfeeding Duration (Children Aged 3-5 Years)

VARIABLES	**(1)** **Coefficient** **BF Duration** (Robust Standard Error)
2013	2.710 (1.844)

Table 5.1. (Continued)

Child Characteristics	
Sex (Base: Male)	
Female	-1.126**
	(0.556)
Birth Weight (Base: LWB)	
Normal BW (2.5-4 kgs)	2.391***
	(0.882)
High BW (4+ kgs)	2.618*
	(1.393)
Missing BW	1.344
	(1.166)
Mother Characteristics	
Age (Base: 20-24[17])	
25-29	-0.411
	(1.115)
30-34	0.402
	(1.192)
35-39	2.259*
	(1.326)
40-44	1.547
	(1.520)
45-49	0.814
	(2.539)
Education Level (Base: Incomplete Primary/No Education)	
Complete Primary	0.0828
	(0.856)
Complete Secondary	-0.0481
	(1.170)
Complete HS and Higher	0.227
	(1.150)
Household Characteristics	
Household Composition	
De Facto Members	0.598***
	(0.227)

[17] Normally, our base category is mothers aged between 15-19 years category (j=1). Yet, no mothers are in that age group. Thus, the base category in this specification is mothers aged 20-24 years category (j=2).

Table 5.1. (Continued)

Total # of (Older) Siblings	1.104***
	(0.296)
Male Fraction (Older) of Siblings	0.719
	(0.676)
Ideal Distance	-0.468*
	(0.239)
Household Wealth (Base: the Poorest)	
Poorer	-2.181**
	(0.917)
Middle	-0.423
	(1.028)
Rich	-2.281**
	(1.123)
Richest	-2.798**
	(1.242)
Regional Characteristics	
Type of Place of Residence (Base: Urban)	
Rural	0.844
	(0.771)
Regional Residence (Base: West)	
South	-1.867**
	(0.780)
Central	-0.148
	(0.833)
North	-2.257**
	(0.932)
East	0.320
	(0.801)
Constant	11.58***
	(2.745)
Observations	1,714
R-squared	0.101

Note: Children's month and year of birth dummies are included as fixed effects.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.1.2. Cox Analysis for Breastfeeding (Longitudinal Data)

Table 5.2 presents the Cox regression results where outcome variable (i.e., Breastfeeding) covers all children under five. As stated earlier, the outcome variable is a time-to-event variable. The time variable is children's age ranging from 0 to 58 months. The failure event is "being weaned". In this respect, Breastfeeding variable takes the value of 1 for each month of "nursing" (i.e., representing survival) and it takes the value of 0 starting with the month that the child is weaned (i.e., representing the failure). The main advantage of using the Cox regression is to include all children in empirical analyses, thus creating a bigger data set.

In Table 5.2, we present Hazard Ratios (i.e., risk of failure) in column (1) and Coefficients in column (2). The interpretations of Hazard Ratio and Coefficients are as follows.

- If the Hazard Ratio is less than 1, it means that the predictor is related to decreased risk of failure (or improved survival). If the Hazard Ratio is greater than 1, it means that the predictor is related to increased risk of failure (or decreased survival).

- A positive coefficient would indicate the probability of the event (cessation of breastfeeding or weaning) increases and (vice versa for a negative coefficient).

Note that the following interpretations are based on column (1) where Hazard Ratios are shown. First, the Cox-generated results are parallel with the OLS model implying a male advantage in breastfeeding. That is, female infants are 14.64% more likely to be weaned than male infants. Second, as opposed to the OLS regression, Table 5.2 implies children of mothers interviewed in the 2013 wave are found to be less likely to experience "weaning" by 10.1%. This also complies with Figure 3.5. Moreover, the effect of birth weight, which is previously found as a significant and a positive correlate of breastfeeding duration, still seems to be

a positive contributor to nursing. The likelihood of being nursed (i.e., survival) increases by 22.49% and 20.49% for those born in normal- and high-birth-weight, respectively. Besides, the Cox model does not show a statistically significant impact of maternal age on the risk of failure (i.e., weaning). For the educational attainment, however, the results are in line the OLS model. That is, we do not find any evidence that the children whose mothers are primary school dropout and/or lack formal education are less or more likely to be weaned than children whose mothers are better-educated (i.e., primary school graduate / secondary school graduate / high school (or higher) graduate).

Apart from this, the effects of household characteristics are almost in the same direction with the OLS estimates, except for the number of (de facto) adult members (i.e., its coefficient lost its significance). The findings illustrate that an increase in the total number of (older) siblings decreases the probability of being weaned by roughly 2.0% for the last-born children. In a similar fashion, the last-born children are 9.51% less prone to be weaned when the share of their older male siblings increases– indicating the importance of sibling sex composition. Also, each birth that brings the family closer to its ideal size increases the likelihood of the cessation of nursing (i.e., the failure) by 3.92%.

On the other hand, children living “Poorer”, “Rich” and the “Richest” households are more inclined to be weaned than those living in the “Poorest” households. Given its interesting nature, the association between household income (proxied by wealth index) and breastfeeding duration for the Turkish context deserves to be addressed in future research to delve underlying reasons. When it comes to residential and regional variation in the likelihood of being weaned, the results show no statistical significance for rural as compared to urban residence. For five regions of Turkey, the findings differ from the OLS model (i.e., the coefficient of North lost its significance) suggesting that children in the South are more likely to experience the failure (i.e., weaning) by 26.82%.

Table 5. 2. Cox Regression Results for Breastfeeding (All Children)

VARIABLES	(1) **Hazard Ratio** (Robust Standard Error)	(2) **Coefficient Breastfeeding** (Robust Standard Error)
2013	0.899***	-0.106***
	(0.0360)	(0.0400)
Child Characteristics		
Sex (Base: Male)		
Female	1.1464***	0.137***
	(0.0440)	(0.0383)
Birth Weight (Base: LWB)		
Normal BW (2.5-4 kgs)	0.7751***	-0.255***
	(0.0496)	(0.0640)
High BW (4+ kgs)	0.7996***	-0.224**
	(0.0723)	(0.0905)
Missing BW	0.8142***	-0.205**
	(0.0658)	(0.0809)
Mother Characteristics		
Age (Base: 15-19)		
20-24	0.9062	-0.0985
	(0.186)	(0.206)
25-29	0.9077	-0.0968
	(0.1875)	(0.205)
30-34	0.8682	-0.141
	(0.181)	(0.210)
35-39	0.7773	-0.252
	(0.166)	(0.214)
40-44	0.7414	-0.299
	(0.167)	(0.225)
45-49	0.7391	-0.302
	(0.206)	(0.279)
Education Level (Base: Incomplete Primary/No Education)		
Complete Primary	1.0815	0.0784
	(0.0602)	(0.0557)
Complete Secondary	1.1187	0.112
	(0.0837)	(0.0748)
Complete HS and Higher	1.0875	0.0839
	(0.0822)	(0.0756)

Table 5.2. (Continued)

Household Characteristics		
Household Composition		
De Facto Members	0.9801	-0.0201
	(0.0137)	(0.0140)
Total # of (Older) Siblings	0.9211***	-0.0821***
	(0.0198)	(0.0216)
Male Fraction (Older) of Siblings	0.9049***	-0.0999**
	(0.0427)	(0.0473)
Ideal Distance	1.0392***	0.0385**
	(0.0185)	(0.0178)
Household Wealth (Base: the Poorest)		
Poorer	1.1357***	0.127**
	(0.0693)	(0.0611)
Middle	1.0340	0.0334
	(0.0704)	(0.0681)
Rich	1.1698***	0.157**
	(0.0885)	(0.0757)
Richest	1.3420***	0.294***
	(0.1164)	(0.0868)
Regional Characteristics		
Type of Place of Residence (Base: Urban)		
Rural	0.9749	-0.0253
	(0.0476)	(0.0489)
Regional Residence (Base: West)		
South	1.2682***	0.238***
	(0.0729)	(0.0575)
Central	0.9502	-0.0510
	(0.0526)	(0.0554)
North	1.0478	0.0467
	(0.0681)	(0.0650)
East	0.9834	-0.0167
	(0.0528)	(0.0537)
Observations		78,749

Note: Children's month and year of birth dummies are included as fixed effects.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.1.3. Breastfeeding by Sex (Longitudinal Data)

In this sub-section, we aim to extend our results on the gender gap in breastfeeding duration. Using the longitudinal data, we provide more precise information on the time when this gap starts and ends. In this respect, we run the regression models conditional on month of age. That is, the regression models are run for each month of age from 0 to 59 one by one. Then, predicted probabilities -corresponding to each month of age- are calculated for both sexes. This enables us to compare the probability of receiving breast milk by sex with respect to their ages, controlling for individual, maternal and household level correlates. The dependent variable has a binary nature taking value of 1 if the child is breastfed in his/her k^{th} month of age, and 0 otherwise.

We first present Figure 5.1, where we do not include the explanatory variables (i.e., we only include year-of-birth and month-of-birth dummies as FEs). To that extent, y-axis shows the (mean) predicted probabilities (after LPM) and x-axis shows the month of age. The aim of doing this is to compare whether the inclusion of covariates leads to any change in the gender gap. According to Figure 5.1, the gender gap in nursing commences roughly in 11^{th} month and disappears in almost 37^{th} month.

In Figure 5.2, the set of explanatory variables and the fixed effects remain the same as in other regressions discussed earlier. As in Figure 5.1, estimations are carried out using LPMs. In this vein, the results are presented in Figure 5.2 where y-axis shows the (mean) predicted probabilities and x-axis shows the month of age. Figure 5.2 illustrates that there is no gender gap until children reach age of 1. That is, it might be interpreted that mothers place equal values on their infants' nutrition and thus health during the first year of life. The gap starts to be observed in the 14^{th} month and persists until roughly 35^{th} month. After 3 years of age, the probability of breastfeeding is not found to differ between girls and boys. It must be noted that the LPMs, which are run with respect to age (month), validate what Figure 5.2 depicts. That is, the coefficient of Female dummy is negative and

statistically significant at conventional levels from 14th to 35th month without any exception (i.e., to see the magnitude, we also run a separate LPM model. It is worth indicating that this LPM model is run for children aged 14-35-months. The results show that females in the 14-35-month age group are 5.07 percentage points less likely to be breastfed. In that age group, 36.84% of the male children are nursed and 31.78% of the female children are nursed).

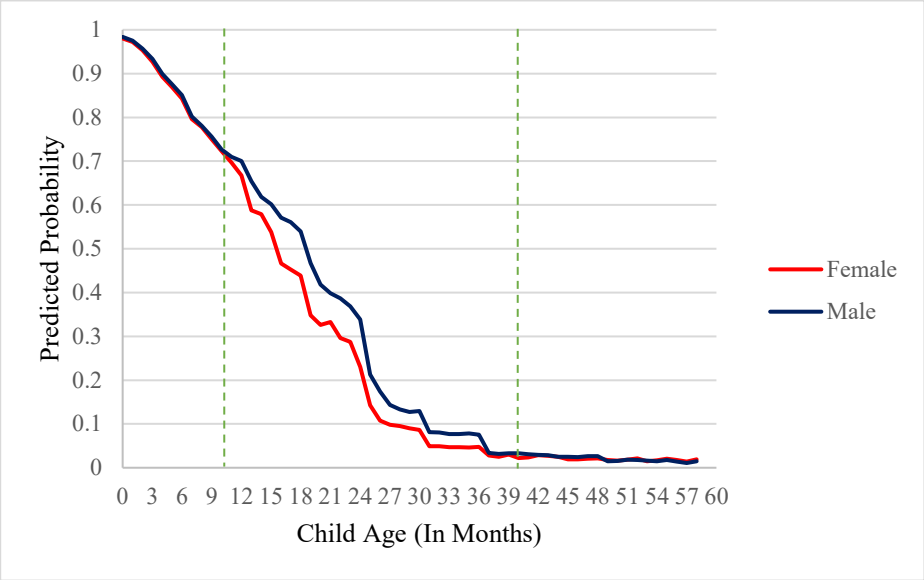

Figure 5. 1. Predicted Probabilities by Sex (All Children) (Without Covariates)
Source: Author's own calculations based on the TDHS-2008 and TDHS-2013.

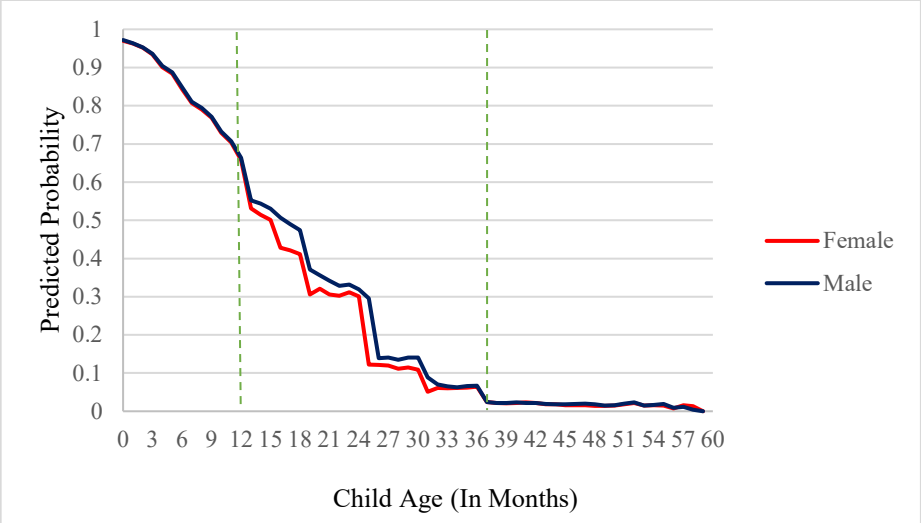

Figure 5. 2. Predicted Probabilities by Sex (All Children) (With Covariates)
Source: Author's own calculations based on the TDHS-2008 and TDHS-2013.

There might be several reasons behind mothers' son-biased preference in breastfeeding. First, male and female infants are found to follow different developmental patterns when considering early fine-motor skills (e.g., coordination of muscles) and gross-motor skills (e.g., initiation of crawling, sitting, and walking) each of which are completely gained by 18th month of age on average (Morley et al., 2015). In the medical literature, substantial portion of research illustrates female infants are more likely to acquire these early motor skills earlier than their male agemates (Singer et al., 1997; Cho et al., 2010; Dinkel and Snyder, 2020). In addition, Leptin hormone[18] is found to be lower in boys than girls (Matsuda et al., 1997; Soliman et al., 2012). Besides, some studies show that boys are at higher risk of developing neo-natal illnesses such as chronic lung diseases and respiratory infections (Bartels et al., 2005; Friedrich et al., 2006). Also, boys are found to be more likely to receive medication as a result of lung-related diseases (Sandri et al., 2004; Warrier et al., 2006). Therefore, mothers might think that boys are more vulnerable than girls, thus they need to be nursed longer. In sum, aforementioned factors might play a substantial role in shaping mothers' decisions to invest more in their sons' health for the Turkish context. For

[18] Leptin is a hormone that is vital for energy balance and insulin secretion. In fact, leptin is positively related to anthropometric growth indicators.

future research, investigation of such factors is of great importance for health professionals and policymakers to improve male infants' health outcomes and to narrow down the gender gap in breastfeeding.

An interesting explanation might be drawn from a recent study coming from the literature of economics conducted by Dagnelie et al (2018). They suggest that pregnant women -purely unconsciously- have an ability to determine the fetal-sex ratio to maintain her descendants in the future if they are exposed to a negative event. In the literature, it is referred as "secondary sex ratio" which implies the odds of embryo's being a male. Living in an insanitary environment, limited access to non-contaminated food and/or exposure to conflicts are the prominent examples of such adverse events. Women living in low- and middle-income countries like India, Bangladesh, and Pakistan -where under five mortality is highly observed because of starvation and pollution-led diseases- may determine the fetal sex-ratio. In turn, they might be willing to protect their potential descendants by favoring their sons. To that extent, nursing is free and healthy, and it inhibits fatal neonatal diseases. Thus, mothers may use breastfeeding as a tool to protect their male children. Yet, this may not explain the gender gap for the Turkish context due to two reasons. First, the under-five mortality rate in 2019 is recorded as 10 per 1,000 live births, while it is 34.3 in India and 30.8 in Bangladesh per 1,000 live births (UNICEF, 2021)[19]. Second, the prevalence of such life-threating negative shocks is rare in Turkey. Hence, there might be some other reasons such as male dominance in the provision of household income, religious beliefs and/or cultural attachments – leading women to practice what they have seen from their mothers before they enter into marriage market (Pande et al., 2007; Almond et al., 2013; Sen et al., 2020).

[19] The data can be found on the website of UNICEF: https://data.unicef.org/country/tur/

5.2. Exclusive Breastfeeding

5.2.1. Exclusive Breastfeeding (EBF) Status (Cross Sectional Data)

Table 5.3 presents the empirical results on the EBF Status of children who are aged between 6 and 59 months. The outcome variable, EBF status, indicates whether children are solely fed with breast milk in the first six months of their life. That is, the EBF Status is a dichotomous variable taking value of 1 for the children who were not given any supplementary food in the first six months of life, 0 otherwise. It must be noted that the children younger than the six-month of age are omitted from the analysis because of the left-truncation problem as addressed in the previous chapter.

The LPM results show that coefficient of Female dummy is negative but statistically insignificant. Therefore, one cannot argue that the EBF status differs by gender for the Turkish infants. The medical literature comes up with two conclusions: there is either no statistical difference between sexes (e.g., Senarath et al., 2010; Heydarpour et al., 2011) or there exists evidence showing a female-advantage (e.g., Jama, et al., 2020; Salim and Stones, 2020) in exclusive nursing. However, there is a study from the economics literature which also implies that gender is not a significant predictor of being exclusively breastfed for the Egyptian babies (Chakravarty, 2015). Thereby, our results are in line with the previous research showing the absence of gender gap in exclusive breastfeeding.

Birth weight is found to have an insignificant effect when it comes discussing EBF status. This contradicts with previous findings because there is a consistent and positive relationship between birth weight and exclusive breastfeeding. For instance, Flaherman et al. (2013) document that low-birth-weight babies are nearly 5 percent less likely to be exclusively nursed in the first three-month of life as compared to normal-birth-weight babies in the United States. To begin with, Mundagowa et al. (2019) show that higher birth weight is associated with greater probabilities for being exclusively breastfed for six months in Zimbabwe.

On the other hand, the results on mothers' characteristics first suggest that (maternal) age does not significantly contribute to EBF status of children. However, evidence coming from other countries yields the following result: the likelihood of feeding infants via solely breast milk for the six month of life increases with maternal age, especially after mothers reach 30 (Sholeye et al., 2015; Maonga et al., 2016; Yeboah et al., 2019). Nevertheless, a branch of literature indicates that any age lower than 25-year is a barrier to practice exclusive breastfeeding (Wardani et al., 2017; Mundagowa et al., 2019; Manyeh et al., 2020). Yet, it is not straightforward to compare the results in Table 5.3 with the aforementioned findings given the mixed signs and insignificance of the age coefficients.

Second, as compared to children of mothers who dropped out from primary school or lack formal education, children of mothers who are secondary school graduates are more likely to be exclusively breastfed by 14.1 percentage points. Given the absence of conclusive findings in the literature, we are unable to make valid interpretations about the impact of maternal schooling on the exclusive breastfeeding. While some portion of studies illustrate a positive effect of holding a high school and/or university diploma (Asare et al., 2018), the others show the opposite (i.e., being a primary school graduate increases the likelihood of being exclusively breastfed) (Giashuddin et al. (2003; Zhao et al., 2017). Besides, there is study presenting a U-shaped impact of maternal education on commitment to exclusive nursing (Alshammari and Haridi, 2021). The authors justify the U-shaped impact as follows. Less-educated mothers may have a strong commitment to conventional motherhood-duties, where breastfeeding is perceived as an immediate responsibility. That is, the perception of less-educated mothers may be an outcome of what was seen from their mothers before they get married and have children. Nonetheless, better-educated mothers are presumed to be more knowledgeable about health and to be conscious about the reciprocal advantages of exclusive breastfeeding as in developed countries such as Belgium and Taiwan (Vanderlinden et al., 2017; Chang et al., 2019).

Furthermore, the coefficients of household characteristics, including household composition and wealth, turn out to be statistically insignificant. In fact, for household composition, even though the signs of the coefficients belonging to (de facto) adult household members, number of older siblings, and male fraction of older siblings are all negative, it is not accurate to make any statistical inference due to p-values corresponding to those coefficients. Using 2015 and 2016 rounds of the DHS for Malawi, Salim and Stones (2020) illustrate that number of older siblings is a positive contributor to odds of being exclusively breastfed for six months. Chakravarty (2015) takes the study of Salim and Stones (2020) one step forward and provides findings on the sibling sex composition. That is, he illustrates that an increase in the male fraction of older siblings reduces the likelihood of receiving supplementary food in the first six months by 4.6 percentage points for the Egyptian babies. Likewise, studies within the medical context (e.g., Sağlam et al., 2019) confirms the fact that the higher number of siblings leads to uninterrupted exclusive nursing in the first six month of life. Yet, there are suggestive piece of evidence documenting a negative correlation between household size (as measured by the number of household members) and the exclusive nursing practice (Ayisi et al., 2014; Manyeh et al., 2020).

For household income, we do not find household income to be associated with breastfeeding. Nonetheless, it would be beneficial to recall the fact that previous research presents mixed evidence as well. Recent evidence shows that children residing in low-income households are more likely to be exclusively breastfed (Jama et al., 2020 for Somali; Alshammari and Harid, 2021 for Saudi Arabia). These studies argue that it is hard for low-income women to buy baby formula. Thus, they have a greater propensity to nurse their children with only breast milk because it is free and healthy. Another branch of the literature shows that practicing exclusive breastfeeding is more common in high-income households (Murage et al., 2011; Duan et al., 2018). As a potential explanation, the authors suggest that in the wealthier households, mothers (simply because they are better-educated) are expected to be more knowledgeable about the health benefits of exclusive nursing.

In addition, the LPM estimates regarding the type of residence point out that children living in rural areas are less likely to be exclusively breastfed by 5.57 percentage points as compared to those living in urban areas – confirming the findings in urban advantage in the literature (e.g., Perez-Escamilla et al., 1995; Shirima et al., 2001; Rollins et al., 2016; Hitachi et al., 2019). Eventually, the infants in the South are more prone to be exclusively breastfed. It is an attention-grabbing finding because the earlier research shows that living in South is associated with early termination of exclusive breastfeeding because of the mothers' perception (i.e., living in a warm-weather area make mothers to believe that their breast milk is insufficient to meet their babies' need of water. Thus, they start giving liquids such as water and milk before 6th month of age) (Li et al., 2002). That is, we do not find evidence in support of the previous research showing that living in South is associated with exclusive breastfeeding.

Finally, we do not find evidence for the effects of birth-month and birth-year of the children. In fact, the literature suggests that the month of birth is highly likely to determine the exclusivity of breastfeeding (Das et al., 2016). The intuition behind relies on the following rationale. If babies are born during the warmer months (i.e., especially in the summer), then mothers might perceive that their breast milk is insufficient to meet the water need of their babies. Thus, the mothers are expected to initiate predominant feeding if they give birth during the summer. However, we do not find such an evidence for the Turkish context.

Table 5. 3. LPM Result on EBF Status (Children Aged Above 6-Month)

VARIABLES	(1) Coefficient EBF Status (Robust Standard Error)
Child Characteristics	
Sex (Base: Male)	
Female	-0.0273
	(0.0226)
Birth Weight (Base: LWB)	
Normal BW (2.5-4 kgs)	0.0179
	(0.0364)
High BW (4+ kgs)	-0.0169
	(0.0530)
Missing BW	-0.0196
	(0.0428)
Mother Characteristics	
Age (Base: 15-19)	
20-24	-0.0585
	(0.0845)
25-29	0.0336
	(0.0858)
30-34	-0.00148
	(0.0881)
35-39	-0.0380
	(0.0933)
40-44	-0.0468
	(0.103)
45-49	0.00623
	(0.136)
Education Level (Base: Incomplete Primary/No Education)	
Complete Primary	0.0323
	(0.0328)
Complete Secondary	0.141***
	(0.0518)
Complete HS and Higher	0.0324
	(0.0484)

Table 5.3. (Continued)

Household Characteristics	
Household Composition	
De Facto Members	-0.00396
	(0.00774)
Total # of (Older) Siblings	-0.00622
	(0.0116)
Male Fraction (Older) of Siblings	-0.00958
	(0.0287)
Ideal Distance	0.00653
	(0.00906)
Household Wealth (Base: the Poorest)	
Poorer	0.00717
	(0.0346)
Middle	-0.0249
	(0.0393)
Rich	0.0338
	(0.0447)
Richest	-0.0198
	(0.0538)
Regional Characteristics	
Type of Place of Residence (Base: Urban)	
Rural	-0.0557**
	(0.0267)
Regional Residence (Base:West)	
South	0.0887**
	(0.0365)
Central	-0.00591
	(0.0342)
North	-0.00735
	(0.0386)
East	0.0452
	(0.0325)
Constant	0.381**
	(0.149)
Observations	2,440
R-squared	0.037

Note: Children's month and year of birth dummies are included as fixed effects. Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1.

5.2.2. Cox Analysis for Exclusive Breastfeeding (EBF) (Longitudinal Data)

Table 5.4 presents the estimation results of the Cox Regression where all children under five are observed retrospectively. The dependent variable is the Exclusive Breastfeeding Duration taking value of 1 for each month (age) that children are exclusively breastfed and start taking value of 0 for each succeeding month (age) when they are first introduced with supplementary food. To sum up, the failure event is defined as "initiation of supplementary food" while the survival can be considered as "being exclusively breastfed". Note that column (1) shows the Hazard Ratio and column (2) is Coefficients. The following interpretations are based on column (1) where Hazard Ratios are shown.

In the light of this information, the Cox Regression results are in line with the Figure 3.7 for gender, implying that experiencing the failure event does not statistically differ between males and females. Nevertheless, the estimation results for the birth-weight remain the same as OLS model. In other words, the effect of birth-weight on exclusive breastfeeding is insignificant.

For maternal age, we still do not find evidence that the age of mothers has a statistically significant effect on being exclusively breastfed. To begin with, when it comes to mother's educational attainment, the Cox Regression confirms both the previous findings in the literature and the OLS regression results (in Table 5.3) for "secondary school completion" category. However, the coefficient of "Complete Primary" gains a significance in this model. That is, the children of secondary school graduate mothers are roughly 25.0% less likely to be given supplementary food than whose mothers are either primary school dropouts or without formal education. Similarly, children of mothers who obtains a primary school diploma are 11.77% less likely to experience the failure event.

For household characteristics, an additional (de facto) adult household member is found to detrimental for being exclusively breastfed (i.e., one additional person in the household increases the probability of receiving liquids and/or solids by

2.13%). Now, this finding validates the former research showing the negative impact of additional household members on exclusive breastfeeding (Manyeh et al., 2020). For other household composition variables (i.e., number of older siblings, male fraction of older siblings, and distance from ideal family size), we find no evidence. In other words, none of the household composition variables create a difference in exclusive nursing. Regarding household income, the Cox-generated results are the same as OLS estimates. That is, we find no evidence.

Moreover, living in rural areas increases the probability of the supplementary food initiation by 15.11% (i.e., it can also be seen in Figure 3.7). Besides, the results on the regional variables do not contradict with the OLS findings. In other words, living in South and East turns out to reduce the likelihood of being given solids and/or liquids for the first time. Finally, the Cox-generated results do not provide a difference across year-of-birth or month-of-birth (dummies) when it comes to being exclusively breastfed.

Table 5. 4. Cox Regression Result for EBF (All Children)

VARIABLES	**(1)** **Hazard Ratio** (Robust Standard Error)	**(2)** **Coefficient** **EBF** (Robust Standard Error)
Child Characteristics		
Sex (Base: Male)		
Female	1.0109	0.0109
	(0.0390)	(0.0386)
Birth Weight (Base: LBW)		
Normal BW (2.5-4 kgs)	0.9137	-0.0902
	(0.0576)	(0.0631)
High BW (4+ kgs)	0.9688	-0.0316
	(0.0915)	(0.0944)
Missing BW	0.8915	-0.115
	(0.0759)	(0.0852)

Table 5.4. (Continued)

Mother Characteristics		
Age (Base: 15-19)		
20-24	0.9784	-0.0218
	(0.126)	(0.129)
25-29	0.8817	-0.126
	(0.113)	(0.128)
30-34	0.8953	-0.111
	(0.118)	(0.132)
35-39	0.9877	-0.0123
	(0.143)	(0.145)
40-44	1.1015	0.0967
	(0.194)	(0.177)
45-49	1.0123	0.0123
	(0.243)	(0.241)
Education Level (Base: Incomplete Primary/No Education)		
Complete Primary	0.8823***	-0.125**
	(0.0502)	(0.0569)
Complete Secondary	0.7557***	-0.280***
	(0.0619)	(0.0819)
Complete HS and Higher	0.8934	-0.113
	(0.0698)	(0.0781)
Household Characteristics		
Household Composition		
De Facto Members	1.0213*	0.0212*
	(0.0124)	(0.0122)
Total # of (Older) Siblings	1.0028	0.00284
	(0.0213)	(0.0212)
Male Fraction (Older) of Siblings	1.0217	0.0216
	(0.0474)	(0.0464)
Ideal Distance	0.9951	-0.00486
	(0.0175)	(0.0177)
Household Wealth (Base: the Poorest)		
Poorer	1.0196	0.0195
	(0.0604)	(0.0592)
Middle	1.1107	0.105
	(0.0755)	(0.0680)
Rich	1.0436	0.0428
	0.0783	(0.0751)
Richest	1.1157	0.110
	(0.0971)	(0.0871)

Table 5.4. (Continued)

Regional Characteristics		
Type of Place of Residence (Base: Urban)		
Rural	1.1511***	0.141***
	(0.0536)	(0.0466)
Regional Residence (Base: West)		
South	0.8714***	-0.138**
	(0.0526)	(0.0604)
Central	0.9887	-0.0113
	(0.0543)	(0.0550)
North	0.9947	-0.00524
	(0.0640)	(0.0643)
East	0.8905***	-0.116**
	(0.0519)	(0.0583)
Observations		11,544

Note: Children's month and year of birth dummies are included as fixed effects.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

CHAPTER 6

CONCLUSION

In this thesis, we aim to reveal the determinants of exclusivity and duration of breastfeeding using a representative sample of Turkish mothers and their offspring. We acknowledge that there are suggestive pieces of evidence in the literature of medicine showing the correlates of the breastfeeding practices. Yet, their findings are far from providing robust information because they do not work with a representative sample of Turkish individuals. Revealing the robust correlates of the breastfeeding practices is vital because appropriate breastfeeding has a potential to contribute to the future human capital formation. To the best of our knowledge, this thesis is the first research that documents the correlates of the exclusivity and duration of breastfeeding in the economics literature. In this vein, we pool 2008 and 2013 waves of the TDHS, each providing a rich and reliable set of variables on the mothers' basic demographics, socio-economic characteristics, and their complete birth records, including information on their children's various health indicators (e.g., nutritional status, anthropometric indicators, and vaccination backgrounds).

We present our results separately for the breastfeeding duration and exclusive breastfeeding duration. Before summarizing the main findings, it would be beneficial to indicate that the estimations based on the longitudinal data (i.e., where we utilize the Cox Regressions) provided more reliable and robust results. Thus, the following interpretations for the breastfeeding duration rely on the Cox-generated results. First, we find that the time interval between the survey years (i.e., 5 years) positively contributes to the breastfeeding length. That is, the children of mothers who were interviewed in the TDHS-2013 are less likely to experience the event of weaning as compared to the children of mothers who were interviewed in the TDHS-2008. Second, our results yield the male advantage in

the duration of breastfeeding. In other words, female infants are more likely to experience the event of weaning than their male counterparts. In addition, we reveal that there is no gender discrimination in the length of breastfeeding in the first year of life. Nevertheless, the male advantage commences roughly in the 14th month and persists until the 35th month of age[20]. Besides, we present strong evidence that low-birth-weight children are weaned earlier than their normal- and high-birth-weight counterparts. When it comes to schooling of mothers, we do not present any evidence. Moreover, we show that there is a significant connection between the household characteristics and breastfeeding. To be more precise, an increase in the total number of (older) siblings reduces the likelihood of weaning. Likewise, the probability of weaning decreases when male fraction of (older) sibling increases. To begin with, each additional child that brings the family to its "ideal" size is found to be a detrimental factor for nursing. In other words, one additional child in the household raises the probability of weaning. Furthermore, the children living in "Poorer", "Rich", and the "Richest" households are at higher risk of weaning than the children living in the "Poorest" households. Eventually, residing in "South" is associated with the greater probabilities of weaning.

Our investigation on the determinants of exclusive breastfeeding -using the Cox Regressions- shows that the mothers are indifferent towards their sons and daughters. That is, we do not provide an evidence that shows a gender gap. Also, we find strong evidence that the likelihood of supplementary food initiation decreases when mothers are (primary school graduates) secondary school graduates (as compared to mothers with primary school dropouts and/or lack formal education). Then, a small but statistically significant effect is found for the presence of (de facto) adult household members. One additional adult household member increases the likelihood of being given liquids and/or solids. Namely, being exclusively nursed decreases with the presence of one additional adult in the household. Perhaps the most attention-grabbing result for the exclusive

[20] These results are produced by using the LPMs.

breastfeeding practices is the rural/urban gap. In particular, rural residence shortens the exclusive breastfeeding as compared to urban residence.

Our estimation results convey significant messages to the policymakers about four particular issues: 1) gender discrimination in the length of nursing; 2) workplace support to ease the work-life balance incompatibility (for better-educated mothers who are more likely to be in the labor force); 3) marketing of breast milk substitutes; and 4) rural/urban gap. We believe that our findings would guide the researchers, health professionals, and policymakers to come up with brand-new policies to achieve the global targets of breastfeeding practices.

To the best of our knowledge, this thesis is the first to reveal that the Turkish mothers prefer making greater investments in their sons' health through prolonged breastfeeding. The son-biased breastfeeding may have negative consequences on the economic outcomes in the long term because female children, who are now underinvested in terms of health, constitute a significant portion of the potential human capital of the future. The investigation of possible reasons (e.g., adherence to cultural and/or religious beliefs towards male dominance in the society) is of great importance to produce appropriate public health policies. To that extent, further research is needed to understand the source(s) of this gender discrimination. We hope that our findings would lead researchers to delve into the underlying reasons.

Besides, we show that the better-educated mothers are less likely to practice the prolonged and exclusive breastfeeding. This might stem from the fact that the higher educational attainment induces greater labor force participation, which in turn results in the incompatibility of work and life balance – as highlighted in the previous literature (Chen et al., 2019). To that extent, further research must be carried out to understand how the event of breastfeeding should be promoted at times when the mother and her offspring are separated. This implies that the Turkish policymakers should consider the ways of increasing the lactation support at workplaces. The potential policies may include, but not limited to, the corporate

lactation programs, which target creating paid break time for milk expression, establishing private nursing rooms, and provision of flexible working hours without wage deduction. Although there is a huge state-variation, the U.S. sets a good example when it comes to the corporate lactation support. For instance, Lactation Accommodation law of 2002 (i.e., in California) mandates employers to ensure that mothers have adequate break time and spare places for milk expression. If any violation is observed, then the employer is obliged to pay $100 (CDC, 2021). At this point, potential policies should not only target mothers working in public sector but also consider mothers working in private sector, where maternal benefits are less provided.

Our estimation results reveal that the duration of breastfeeding in the "Poorer", "Rich" and the "Richest" households is shorter than it is the "Poorest" households. This might be a consequence of the inappropriate marketing of the nutrients (e.g., infant formula and/or therapeutic milk) portrayed as breast milk substitutes. As discussed earlier, the mothers residing in high-income households may choose to buy these substitutes because of two reasons. First, they have no financial barrier to buy the infant formula. Second, they are more likely to be exposed to the advertisements of such nutrients (because they are more likely to have TVs and the Internet connection in their home) which in turn make mothers believe that these goods are appropriate replacements for breast milk. Therefore, the Turkish policymakers should regulate the marketing of the breast milk substitutes to prevent mothers from being deluded.

Furthermore, we document that the exclusive breastfeeding duration in rural is considerably lower than urban. The literature also provides evidence showing that there is a rural disadvantage in low- and middle-income countries (Rollins et al., 2016; Hitachi et al., 2019). The rural/urban gap might stem from various factors. For instance, as mentioned earlier, 61 cities of Turkey host the Mother- and Baby-Friendly Hospitals. Yet, the spatial distribution of these hospitals might be uneven in Turkey. In turn, the mothers residing in rural areas may not receive appropriate training as compared to mothers in urban areas. Hence, we believe that

policymakers should design policies to minimize the rural/urban gap by targeting women in rural Turkey.

Considering the strong correlation between economic growth and human capital, exploring the determinants of breastfeeding practices is of paramount importance especially for a middle-income country, like Turkey - who has a long way to go to become a developed country. Finally, we hope that this thesis constitutes a point of departure for future research aiming to reveal other potential correlates of breastfeeding practices.

REFERENCES

Abdulwadud, O. A., & Snow, M. E. (2007). Interventions in the workplace to support breastfeeding for women in employment. *Cochrane Database of Systematic Reviews*, (3), CD006177.

Adelian, R., Jamali, J., Zare, N., Ayatollahi, S. M., Pooladfar, G. R., and Roustaei, N. (2015). Comparison of Cox's Regression Model and Parametric Models in Evaluating the Prognostic Factors for Survival after Liver Transplantation in Shiraz during 2000-2012. *International Journal of Organ Transplantation Medicine*, *6*(3), 119-125.

Adewuyi, E. O., Zhao, Y., Khanal, V., Auta, A., & Bulndi, L. B. (2017). Rural-urban differences on the rates and factors associated with early initiation of breastfeeding in Nigeria: further analysis of the Nigeria demographic and health survey, 2013. *International Breastfeeding Journal*, *12*, 51.

Adhikari, M., Khanal, V., Karkee, R., & Gavidia, T. (2014). Factors associated with early initiation of breastfeeding among Nepalese mothers: Further analysis of Nepal Demographic and Health Survey, 2011. *International Breastfeeding Journal*, *9*(1).

Agho, K. E., Dibley, M. J., Odiase, J. I., & Ogbonmwan, S. M. (2011). Determinants of exclusive breastfeeding in Nigeria. *BMC Pregnancy and Childbirth*, *11*(1).

Ahmed, A.E., & Salih, O.A. (2019). Determinants of the early initiation of breastfeeding in the Kingdom of Saudi Arabia. *International Breastfeeding Journal*, 14.

Ajami, M., Abdollahi, M., Salehi, F., Oldewage-Theron, W., & Jamshidi-Naeini, Y. (2018). The Association between Household Socioeconomic Status, Breastfeeding, and Infants' Anthropometric Indices. *International Journal of Preventive Medicine*, *9*, 89.

Akter, S., & Rahman, M. M. (2010). Duration of breastfeeding and its correlates in Bangladesh. *Journal of Health, Population, and Nutrition*, *28*(6), 595-601.

Al-Ghwass, M. M. E., & Ahmed, D. (2011). Prevalence and Predictors of 6-Month Exclusive Breastfeeding in a Rural Area in Egypt. *Breastfeeding Medicine*, *6*(4), 191-196.

Almond, D., Edlund, L., & Milligan, K. (2013). Son Preference and the Persistence of Culture: Evidence from South and East Asian Immigrants to Canada. *Population and Development Review*, *39*(1), 75-95.

Alshammari, M. B., & Haridi, H. K. (2021). Prevalence and Determinants of Exclusive Breastfeeding Practice among Mothers of Children Aged 6-24 Months in Hail, Saudi Arabia. *Scientifica*, *2021*, 1-10.

Anderson, J. W., Johnstone, B. M., & Remley, D. T. (1999). Breast-feeding and cognitive development: a meta-analysis. *American Journal of Clinical Nutrition*, *70*(4), 525-535.

Angelsen, N. K. (2001). Breast feeding and cognitive development at age 1 and 5 years. *Archives of Disease in Childhood*, *85*(3), 183-188.

Arora, A., Manohar, N., Hayen, A., Bhole, S., Eastwood, J., Levy, S., & Scott, J. A. (2017). Determinants of breastfeeding initiation among mothers in Sydney, Australia: findings from a birth cohort study. *International Breastfeeding Journal*, *12*(1).

Asare, B. Y.-A., Preko, J. V., Baafi, D., & Dwumfour-Asare, B. (2018). Breastfeeding practices and determinants of exclusive breastfeeding in a cross-sectional study at a child welfare clinic in Tema Manhean, Ghana. *International Breastfeeding Journal*, *13*(1).

Bachrach, V. R. G., Schwarz, E., & Bachrach, L. R. (2003). Breastfeeding and the risk of hospitalization for respiratory disease in infancy: a meta-analysis. *Archives of Pediatrics & Adolescent Medicine*, *157*(3), 237-243.

Bala, G., Popovic., B. & Jaksic, D. (2009). Trend of changes of general motor ability structure in pre-school children. Conference Paper: Exercise and Quality of Life.

Bartels, D. B., Kreienbrock, L., Dammann, O., Wenzlaff, P., and Poets, C. F. (2005). Population based study on the outcome of small for gestational age newborns. *Archives of Disease in Childhood. Fetal and Neonatal Edition*, *90*(1), 53-59.

Bartels, M., van Beijsterveldt, C. E., & Boomsma, D. I. (2009). Breastfeeding, maternal education and cognitive function: a prospective study in twins. *Behavior Genetics*, *39*(6), 616-622.

Becker, G. S. (1960). An economic analysis of fertility. Demographic and Economic Change in Developed Countries. Princeton: Princeton University Press.

Becker, G. S., & Lewis, H. G. (1973). On the interaction between the quantity and quality of children. *Journal of Political Economy*, *81*(2), 279-288.

Becker, G. S., & Tomes, N. (1976). Child endowments and the quantity and quality of children. *Journal of Political Economy*, *84*(4), 143-162.

Bertini, G., Perugi, S., Dani, C., Pezzati, M., Tronchin, M., & Rubaltelli, F. F. (2003). Maternal Education and the Incidence and Duration of Breast Feeding: A Prospective Study. *Journal of Pediatric Gastroenterology and Nutrition*, *37*(4), 447-452.

Betrán, A. P., Ye, J., Moller, A. B., Zhang, J., Gülmezoglu, A. M., & Torloni, M. R. (2016). The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014. *Plos One*, *11*(2), e0148343.

Biks, G. A., Berhane, Y., Worku, A., & Gete, Y. K. (2015). Exclusive breast feeding is the strongest predictor of infant survival in Northwest Ethiopia: a longitudinal study. *Journal of Health, Population and Nutrition*, *34*(1).

Borra, C., Iacovou, M., & Sevilla, A. (2012). The effect of breastfeeding on children's cognitive and noncognitive development. *Labour Economics*, *19*(4), 496-515.

Brown, A., & Jordan, S. (2013). Impact of birth complications on breastfeeding duration: an internet survey. *Journal of Advanced Nursing*, *69*(4), 828-839.

Card, D. (2001). Estimating the Return to Schooling: Progress on Some Persistent Econometric Problems. *Econometrica*, *69*(5), 1127-1160.

Carneiro, P., & J. Heckman. (2003). Human capital policy. National Bureau of Economic Research. Discussion Paper No. 9495.

Centers for Disease Control and Prevention (CDC). (2018). Breastfeeding. Washington, DC, United States.

Centre for Disease Control and Prevention (CDC). (2020). Key Breastfeeding Indicators. Washington, DC, United States.

Centre for Disease Control and Prevention (CDC). (2020). Maternal Diet. Washington, DC, United States.

Centre for Disease Control and Prevention (CDC). (2021). Support for Breastfeeding in the Workplace. Washington, DC, United States.

Chakravarty, A. (2015). Gender-Biased Breastfeeding in Egypt: Examining the Fertility Preference Hypotheses of Jayachandran and Kuziemko (2011). *Journal of Applied Econometrics*, *30*(5), 848-855.

Chang, P.-C., Li, S.-F., Yang, H.-Y., Wang, L.-C., Weng, C.-Y., Chen, K.-F., Chen, W., & Fan, S.-Y. (2019). Factors associated with cessation of exclusive breastfeeding at 1 and 2 months postpartum in Taiwan. *International Breastfeeding Journal*, *14*(1).

Chaparro, C. M., & Lutter, C. K. (2010). Increases in Breastfeeding Duration Observed in Latin America and the Caribbean and The Role of Maternal Demographic and Healthcare Characteristics. *Food and Nutrition Bulletin*, *31*(2), 117-127.

Chaves, R. G., Lamounier, J. A., and César, C. C. (2007). Factors associated with duration of breastfeeding. *Jornal De Pediatria*, *83*(3), 241-246.

Chekol, D. A., Biks, G. A., Gelaw, Y. A., & Melsew, Y. A. (2017). Exclusive breastfeeding and mothers' employment status in Gondar town, Northwest

Ethiopia: a comparative cross-sectional study. *International Breastfeeding Journal*, *12*(1).

Chen, C., Cheng, G., & Pan, J. (2019). Socioeconomic status and breastfeeding in China: an analysis of data from a longitudinal nationwide household survey. *BMC Pediatrics*, *19*, 167.

Cho, J., Holditch-Davis, D., & Miles, M. S. (2010). Effects of gender on the health and development of medically at-risk infants. *Journal of obstetric, gynecologic, and neonatal nursing*, *39*(5), 536-549.

Colodro-Conde, L., Sánchez-Romera, J. F., Tornero-Gómez, M. J., Pérez-Riquelme, F., Polo-Tomás, M., & Ordoñana, J. R. (2011). Relationship between level of education and breastfeeding duration depends on social context: breastfeeding trends over a 40-year period in Spain. *Journal of Human Lactation*, *27*(3), 272-278.

Colombo, L., Crippa, B. L., Consonni, D., Bettinelli, M. E., Agosti, V., Mangino, G., Bezze, E. N., Mauri, P. A., Zanotta, L., Roggero, P., Plevani, L., Bertoli, D., Giannì, M. L., & Mosca, F. (2018). Breastfeeding Determinants in Healthy Term Newborns. *Nutrients*, *10*(1), 48.

Cox, D. R. (1972). Regression Models and Life-Tables. *Journal of the Royal Statistical Society. Series B (Methodological)*, *34*(2), 187-220.

Cox, D. R., & Oakes, D. (1998). Analysis of survival data. Chapman & Hall/CRC.

Cullinane, M., Amir, L. H., Donath, S. M., Garland, S. M., Tabrizi, S. N., Payne, M. S., & Bennett, C. M. (2015). Determinants of mastitis in women in the CASTLE study: a cohort study. *BMC Family Practice*, *16*(2), 181-189.

Dagnelie, O., Luca, G. D., & Maystadt, J.-F. (2018). Violence, selection and infant mortality in Congo. *Journal of Health Economics*, *59*, 153-177.

Dashti, M., Scott, J. A., Edwards, C. A., & Al-Sughayer, M. (2010). Determinants of breastfeeding initiation among mothers in Kuwait. *International Breastfeeding Journal*, *5*(1), 7.

Dayıoğlu, M., Kırdar, M. G., &Tansel, A. (2009). Impact of Sibship Size, Birth Order and Sex Composition on School Enrolment in Urban Turkey. *Oxford Bulletin of Economics and Statistics*, *71*(3), 399–426.

Deoni, S. C., Dean, D. C., Piryatinsky, I., O'Muircheartaigh, J., Waskiewicz, N., Lehman, K., Han, M., & Dirks, H. (2013). Breastfeeding and early white matter development: A cross-sectional study. *Neuroimage*, *82*, 77-86.

Demographic and Health Survey (DHS) Program. (2021). Using Datasets for Analysis. Retrieved from: https://dhsprogram.com/data/Using-DataSets-for-Analysis.cfm

Der, G., Batty, G. D., & Deary, I. J. (2006). Effect of breast feeding on intelligence in children: prospective study, sibling pairs analysis, and meta-analysis. *BMJ (Clinical research edition)*, *333*(7575), 945.

Dewey, K. G., Cohen, R. J., Brown, K. H., & Rivera, L. L. (2001). Effects of Exclusive Breastfeeding for Four versus Six Months on Maternal Nutritional Status and Infant Motor Development: Results of Two Randomized Trials in Honduras. *Journal of Nutrition*, *131*(2), 262-267.

Diaz, H. R., Wang, S., Anuar, F., Qian, Y., Björkholm, B., Samuelsson, A., Hibberd, M.L., Forssberg, H., & Pettersson, S. (2011). Normal gut microbiota modulates brain development and behavior. *Proceedings of the National Academy of Sciences*, 108(7), 3047-3052.

Dinkel, D., & Snyder, K. (2020). Exploring gender differences in infant motor development related to parent's promotion of play. Infant behavior & Development, *59*, 101440.

Dinterman, R., & Katchova, A. L. (2020). Survival analysis of farm bankruptcy filings: Evaluating the time to completion of chapter 12 bankruptcy cases. *Agribusiness*, *37*(2), 324-347.

Doepke, M. (2015). Gary Becker on the quantity and quality of children. *Journal of Demographic Economics*, *81*(1), 59-66.

Doğa-Öcal, F., Vural-Yılmaz, Z., Ceyhan, M., Fadıl Kara, O., & Küçüközkan, T. (2017). Early initiation and exclusive breastfeeding: Factors influencing

the attitudes of mothers who gave birth in a baby-friendly hospital. *Journal of Turkish Society of Obstetric and Gynecology*, 1-9.

Duan, Y., Yang, Z., Lai, J., Yu, D., Chang, S., Pang, X., Jiang, S., Zhang, H., Bi, Y., Wang, J., Scherpbier, R., Zhao, L., & Yin, S. (2018). Exclusive Breastfeeding Rate and Complementary Feeding Indicators in China: A National Representative Survey in 2013. *Nutrients*, *10*(2), 249.

Dubois, L., & Girard, M. (2003). Social determinants of initiation, duration and exclusivity of breastfeeding at the population level: the results of the Longitudinal Study of Child Development in Quebec (ELDEQ 1998-2002). *Canadian Journal of Public Health*, *94*(4), 300-305.

Duijts, L., Jaddoe, V. W., Hofman, A., & Moll, H. A. (2010). Prolonged and exclusive breastfeeding reduces the risk of infectious diseases in infancy. *Pediatrics*, *126*(1), 18-25.

Dyson, L., Renfrew, M., Alison, M., McCormick, F., Herbert, G., and and Thomas, J. (2006). Promotion of breastfeeding initiation and duration. Paper presented at the Evidence into Practice Briefing.

Eren, T., Kural, B., Yetim, A., Boran, P., & Gökçay, G. (2018). Breastfeeding experiences of female physicians and the impact of the law change on breastfeeding. *Türk Pediatri Arşivi*, *53*(4), 238–244.

European Union. (2004). EU Project on Promotion of Breastfeeding in Europe. Protection, promotion and support of breastfeeding in Europe: A blueprint for action. Paper presented at the EU Conference on Promotion of Breastfeeding in Europe.

Feachem, R. G., & Koblinsky, M. A. (1984). Interventions for the control of diarrhoeal diseases among young children: promotion of breast-feeding. *Bulletin of the World Health Organization*, *62*(2), 271-291.

Feinstein, L. (2003). Inequality in the early cognitive development of British children in the 1970 cohort. *Economica*, *70*, 73-98.

Fergusson, D. M., Horwood, L. J., & Shannon, F. T. (1987). Breastfeeding and Later Cognitive and Academic Outcomes. *Journal of Child Psychology and Psychiatry*, *28*(3), 378-386.

Fergusson, D. M., Horwood, L. J., & Shannon, F. T. (1998). Breastfeeding And Subsequent Social Adjustment In Six- To Eight-Year-Old Children. *Journal of Child Psychology and Psychiatry*, *28*(3), 378-386.

Flaherman, V. J., McKean, M., & Cabana, M. D. (2013). Higher Birth Weight Improves Rates of Exclusive Breastfeeding Through 3 Months. *ICAN: Infant, Child, & Adolescent Nutrition*, *5*(4), 200-203.

Fledderjohann, J., Agrawal, S., Vellakkal, S., Basu, S., Campbell, O., Doyle, P., Ebrahim, S., & Stuckler, D. (2014). Do Girls Have a Nutritional Disadvantage Compared with Boys? Breastfeeding, Food Consumption, and Mortality among Indian Siblings. *European Journal of Public Health*, *24*.

Friedrich, L., Stein, R. T., Pitrez, P. M., Corso, A. L., & Jones, M. H. (2006). Reduced lung function in healthy preterm infants in the first months of life. *American Journal of Respiratory and Critical Care Medicine*, *173*(4), 442-447.

Gartner, L.M., Morton, J., Lawrence, R.A., Naylor, A.J., O'Hare, D., Schanler, R.J., & Eidelman, A.I. (2005). Breastfeeding and the use of human milk. *Pediatrics*, *115*(2), 496-506.

Gebregzabiherher, Y., Haftu, A., Weldemariam, S., & Gebrehiwet, H. (2017). The Prevalence and Risk Factors for Low Birth Weight among Term Newborns in Adwa General Hospital, Northern Ethiopia. *Obstetrics and Gynecology International*, 2017, 1-7.

Giashuddin, M. S., Kabir, M., Rahman, A., & Hannan, M. A. (2003). Exclusive breastfeeding and nutritional status in Bangladesh. *Indian Journal of Pediatrics*, *70*(6), 471-475.

Gill, S. V., May-Benson, T. A., Teasdale, A., & Munsell, E. G. (2013). Birth and developmental correlates of birth weight in a sample of children with potential sensory processing disorder. *BMC Pediatrics*, *13*(1).

Guo, S., Fu, X., Scherpbier, R. W., Wang, Y., Zhou, H., Wang, X., & Hipgrave, D. B. (2013). Breastfeeding rates in central and western China in 2010:

Implications for child and population health. *Bulletin of the World Health Organization*, *91*(5), 322-331.

Habicht, J. P., DaVanzo, J., & Butz, W. P. (1988). Mother's milk and sewage: their interactive effects on infant mortality. *Pediatrics*, *81*(3), 456-461.

Hacettepe University Institute of Population Studies (HIPS) (1998). Turkish Demographic and Health Survey Main Report - 1998.

Hacettepe University Institute of Population Studies (HIPS) (2003). Turkish Demographic and Health Survey Main Report - 2003.

Hacettepe University Institute of Population Studies (HIPS) (2008). Turkish Demographic and Health Survey Main Report - 2008.

Hacettepe University Institute of Population Studies (HIPS) (2013). Turkish Demographic and Health Survey Main Report - 2013.

Hacettepe University Institute of Population Studies (HIPS) (2018). Turkish Demographic and Health Survey Main Report - 2018.

Hanson, L. A., & Söderström, T. (1981). Human milk: Defense against infection. *Progress in Clinical and Biological Research*, *61*, 147-159.

Haroon, S., Das, J. K., Salam, R. A., Imdad, A., & Bhutta, Z. A. (2013). Breastfeeding promotion interventions and breastfeeding practices: a systematic review. BMC Public Health, 13(3).

Hauck, Y. L., Fenwick, J., Dhaliwal, S. S., & Butt, J. (2011). A Western Australian survey of breastfeeding initiation, prevalence and early cessation patterns. Maternal and Child Health Journal, 15(2), 260-268.

Haughton, J., Gregorio, D., & Pérez-Escamilla, R. (2010). Factors associated with breastfeeding duration among Connecticut Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) participants. Journal of human lactation: *Official Journal of International Lactation Consultant Association*, *26*(3), 266-273.

Heck, K. E., Braveman, P., Cubbin, C., Chávez, G. F., and Kiely, J. L. (2006). Socioeconomic status and breastfeeding initiation among California mothers. *Public Health Reports*, *121*(1), 51-59.

Heydarpour, S., Golboni, F., Heydarpour, F., & Timareh, M. (2011). Factors associated with exclusive breastfeeding in Kermanshah in 2007, *Journal of Kermanshah University of Medical Sciences*, *15*(3).

Hitachi, M., Honda, S., Kaneko, S., & Kamiya, Y. (2019). Correlates of exclusive breastfeeding practices in rural and urban Niger: a community-based cross-sectional study. *International Breastfeeding Journal*, *14*(1).

Hobbs, A. J., Mannion, C. A., McDonald, S. W., Brockway, M., & Tough, S. C. (2016). The impact of caesarean section on breastfeeding initiation, duration and difficulties in the first four months postpartum. *BMC Pregnancy and Childbirth*, *16*(1).

Hossain, M., Islam, A., Kamarul, T., & Hossain, G. (2018). Exclusive breastfeeding practice during first six months of an infant's life in Bangladesh: A country based cross-sectional study. *BMC Pediatrics, 18*(1), 93.

Howie, P.W., Forsyth, J.S., Ogston, S.A., Clark, A., & Florey, C.D. (1990). Protective effect of breast-feeding against infection. *British Medical Journal*, *300*(6716), 11-16.

Iliff, P. J., Piwoz, E. G., Tavengwa, N. V, Zunguza, C. D., Marinda, E. T., Nathoo, K. J., Moullton, L.H., Ward, B.J., & Humphrey, J. H. (2005). Early exclusive breastfeeding reduces the risk of postnatal HIV-1 transmission and increases HIV-free survival. *AIDS*, *19*(7), 699-708.

Innis, S. M. (2004). Polyunsaturated fatty acids in human milk: An essential role in infant development. *Advanced Experiments in Medical Biology*, *554*,27-43.

International Labor Organization (ILO). (2000). Maternity Protection Convention, 2000 (No. 183)

Ip, S., Chung, M., Raman,G., Chew, P., Magula, N., DeVine, D., Trikalinos, T., & Lau, J. (2007). Breastfeeding and maternal and infant health outcomes in developed countries Report No. 153.

Jama, A., Gebreyesus, H., Wubayehu, T., Gebregyorgis, T., Teweldemedhin, M., Berhe, T., & Berhe, N. (2020). Exclusive breastfeeding for the first six months of life and its associated factors among children age 6-24 months in Burao district, Somaliland. *International Breastfeeding Journal*, *15*(1).

Jayachandran, S., & Kuziemko, I. (2011). Why Do Mothers Breastfeed Girls Less than Boys? Evidence and Implications for Child Health in India. *The Quarterly Journal of Economics*, *126*(3), 1485-1538.

Kabir, I., Khanam, M., Agho, K. E., Mihrshahi, S., Dibley, M. J., & Roy, S. K. (2011). Determinants of inappropriate complementary feeding practices in infant and young children in Bangladesh: secondary data analysis of Demographic Health Survey 2007. *Maternal & Child Nutrition*, *8*(2), 11-27.

Kaneko, A., Kaneita, Y., Yokoyama, E., Miyake, T., Harano, S., Suzuki, K., Ibuka, E., Tsutsui, T., YukoYamamoto, & Ohida, T. (2006). Factors associated with exclusive breast-feeding in Japan: for activities to support child-rearing with breast-feeding. *Journal of Epidemiology*, *16*(2), 57-63.

Karaoğlan, H. D., & Saraçoğlu, D. Ş. (2018). Socio-Economic Factors Affecting Early Childhood Health: the Case of Turkey. *Child Indicators Research*, *11*(3), 1051-1075.

Katchova, A. L. (2013). Survival Analysis [Video]. YouTube. https://www.youtube.com/watch?v=fTX8GghbBPc&t=1433s

Kimani-Murage, E., Madise, N., Fotso, J.-C., Kyobutungi, C., Kavao, M., Gitau, T., & Yatich, N. (2011). P2-432 Patterns and determinants of breastfeeding and complementary feeding practices in urban informal settlements, Nairobi, Kenya. *Journal of Epidemiology & Community Health*, *65*(1).

Kintner, H. J. (1985). Trends and Regional Differences in Breastfeeding in Germany From 1871 to 1937. *Journal of Family History*, *10*(2), 163-182.

Kitano, N., Nomura, K., Kido, M., Murakami, K., Ohkubo, T., Ueno, M., a Sugimoto, M. (2015). Combined effects of maternal age and parity on successful initiation of exclusive breastfeeding. *Preventive Medicine Reports*, *3*, 121-126.

Kitsantas, P., & Palla, H. (2017). Mode of Delivery and Breastfeeding Practices. *International Journal of Pregnancy & Child Birth*, *2*(6).

Koç, I. (2003). Increased Cesarean section rates in Turkey. *The European Journal of Contraception & Reproductive Health Care*, *8*(1), 1-10.

Kogan, M. D., Singh, G. K., Dee, D. L., Belanoff, C., & Grummer-Strawn, L. M. (2008). Multivariate analysis of state variation in breastfeeding rates in the United States. *American Journal of Public Health*, *98*(10), 1872-1880.

Kramer, M., & Kakuma, R (2012). Optimal duration of exclusive breastfeeding. *Cochrane Database System Review*, *15*(8), 11-12.

Laksono, A. D., Wulandari, R. D., Ibad, M., & Kusrini, I. (2021). The effects of mother's education on achieving exclusive breastfeeding in Indonesia. *BMC Public Health*, *21*(1).

Lee, H., Park, H., Ha, E., Hong, Y. C., Ha, M., Park, H., Kim, B. N., Lee, B., Lee, S. J., Lee, K. Y., Kim, J. H., Jeong, K. S., & Kim, Y. (2016). Effect of Breastfeeding Duration on Cognitive Development in Infants: 3-Year Follow-up Study. *Journal of Korean Medical Science*, *31*(4), 579-584.

Li, R., Ogden, C., Ballew, C., Gillespie, C., & Grummer-Strawn, L. (2002). Prevalence of Exclusive Breastfeeding Among US Infants: The Third National Health and Nutrition Examination Survey (Phase II, 1991-1994). *American Journal of Public Health*, *92*(7), 1107-1110.

Lindau, J. F., Mastroeni, S., Gaddini, A., Di Lallo, D., Fiori Nastro, P., Patanè, M., Girardi, P., & Fortes, C. (2014). Erratum to: Determinants of exclusive breastfeeding cessation: identifying an "at risk population" for special support. *European Journal of Pediatrics*, *174*(4), 541-541.

Liu, J., Shi, Z., Spatz, D., Loh, R., Sun, G., & Grisso, J. (2014). Social and demographic determinants for breastfeeding in a rural, suburban and city area of South East China. *Contemporary Nurse*, *45*(2), 234-243.

Liu, P., Qiao, L., Xu, F., Zhang, M., Wang, Y., & Binns, C. W. (2013). Factors associated with breastfeeding duration: a 30-month cohort study in northwest China. Journal of human lactation. *Official Journal of International Lactation Consultant Association*, *29*(2), 253-259.

Lucijanic, M., & Petrovecki, M. (2012). Analysis of censored data. *Biochemia Medica*, *22*(2), 151-155.

Manyeh, A. K., Amu, A., Akpakli, D. E., Williams, J. E., & Gyapong, M. (2020). Estimating the rate and determinants of exclusive breastfeeding practices among rural mothers in Southern Ghana. *International Breastfeeding Journal*, *15*(1).

Maonga, A. R., Mahande, M. J., Damian, D. J., & Msuya, S. E. (2015). Factors Affecting Exclusive Breastfeeding among Women in Muheza District Tanga Northeastern Tanzania: A Mixed Method Community Based Study. *Maternal and Child Health Journal*, *20*(1), 77-87.

Marques, R., Taddei, J. A., Konstantyner, T., Lopez, F. A., Marques, A. C., de Oliveira, C. S., & Braga, J. A. (2015). Anthropometric indices and exclusive breastfeeding in the first six months of life: a comparison with reference standards NCHS, 1977 and WHO, 2006. *International Breastfeeding Journal*, *10*(1).

Matsuda, J., Yokota, I., Iida, M., Murakami, T., Naito, E., Ito, M., Shima, K., & Kuroda, Y. (1997). Serum leptin concentration in cord blood: relationship to birth weight and gender. *The Journal of Clinical Endocrinology and Metabolism*, *82*(5), 1642-1644.

McCrory, C., & Murray, A. (2013). The effect of breast-feeding on neuro-development in infancy. *Maternal and Child Health Journal*, *17*(9), 1680-1688.

Mihrshahi, S., Kabir, I., Roy, S. K., Agho, K. E., Senarath, U., & Dibley, M. J. (2010). Determinants of Infant and Young Child Feeding Practices in

Bangladesh: Secondary Data Analysis of Demographic and Health Survey 2004. *Food and Nutrition Bulletin*, *31*(2), 295-313.

Mokarram, R., Emadi, M., Rad, A. H., & Nooghabi, M. J. (2018). A comparison of parametric and semi-parametric survival models with artificial neural networks. *Communications in Statistics - Simulation and Computation*, *47*(3), 738-746.

Morley, D., Till, K., Ogilvie, P., & Turner, G. (2015). Influences of gender and socioeconomic status on the motor proficiency of children in the UK. *Human Movement Science*, *44*, 150-156.

Mortensen, E. L. (2002). The Association Between Duration of Breastfeeding and Adult Intelligence. *JAMA*, 287(18), 2365.

Moser, T., R, E., & Egil, T, F. (2017). Development of motor-life-skills: variations in children at risk for motor difficulties from the toddler age to preschool age. *European Journal of Special Needs Education*, *33*(1), 118-133.

Mundagowa, P. T., Chadambuka, E. M., Chimberengwa, P. T., & Mukora-Mutseyekwa, F. (2019). Determinants of exclusive breastfeeding among mothers of infants aged 6 to 12 months in Gwanda District, Zimbabwe. *International Breastfeeding Journal*, *14*(1).

Mylonas, I., & Friese, K. (2015). Indications for and Risks of Elective Cesarean Section. *Deutsches Arzteblatt International*, *112*(29-30), 489-495.

Neves, P. A., Barros, A. J., Gatica-Domínguez, G., Vaz, J. S., Baker, P., & Lutter, C. K. (2021). Maternal education and equity in breastfeeding: trends and patterns in 81 low- and middle-income countries between 2000 and 2019. *International Journal for Equity in Health*, *20*(1).

Palloni, A., & Millman, S. (1986). Effects of Inter-Birth Intervals and Breastfeeding on Infant and Early Childhood Mortality. *Population Studies*, *40*(2), 215-236.

Palmer, J. R., Viscidi, E., Troester, M. A., Hong, C.-C., Schedin, P., Bethea, T. N., Bandera, E. V., Borges, V., McKinnon, C., Haiman, C. A., Lunetta, K.,

Kolonel, L. N., Rosenberg, L., Olshan, A. F., & Ambrosone, C. B. (2014). Parity, Lactation, and Breast Cancer Subtypes in African American Women: Results from the AMBER Consortium. *Journal of the National Cancer Institute*, *106*(10).

Pande, R. P., & Astone, N. M. (2007). Explaining son preference in rural India: the independent role of structural versus individual factors. *Population Research and Policy Review*, 26(1), 1-29.

Pentice, A. (1996). Constituents of human milk. *Food and Nutrition Bulletin*, *17*(4), 1-10.

Perez-Escamilla, R., Lutter, C., Segall, A. M., Rivera, A., Treviño-Siller, S., & Sanghvi, T. (1995). Exclusive breast-feeding duration is associated with attitudinal, socioeconomic and biocultural determinants in three Latin American countries. *The Journal of Nutrition*, *125*(12), 2972-2984.

Petryk, A., Harris, S., & Jongbloed, L. (2007). Breastfeeding and Neurodevelopment: A Literature Review. *Infants & Young Children*, *20*(2), 120-134.

Pope, C. J., Mazmanian, D., Bédard, M., & Sharma, V. (2016). Breastfeeding and postpartum depression: Assessing the influence of breastfeeding intention and other risk factors. *Journal of Affective Disorders*, *200*, 45-50.

Qin, H., Zhang, L., Zhang, L., Zhang, W., Li, L., Deng, X., Tian, D., Deng, J., & Hu, G. (2017). Prevalence of Breastfeeding: Findings from the First Health Service Household Interview in Hunan Province, China. *International Journal of Environmental Research and Public Health*, *14*(2), 150.

Regan, J., Thompson, A., & DeFranco, E. (2013). The influence of mode of delivery on breastfeeding initiation in women with a prior cesarean delivery: a population-based study. Breastfeeding medicine. *Official Journal of the Academy of Breastfeeding Medicine*, *8*(2), 181-186.

Rito, A. I., Buoncristiano, M., Spinelli, A., Salanave, B., Kunešová, M., Hejgaard, T., García Solano, M., Fijałkowska, A., Sturua, L., Hyska, J., Kelleher, C., Duleva, V., Musić Milanović, S., Farrugia Sant'Angelo, V., Abdrakhmanova, S., Kujundzic, E., Peterkova, V., Gualtieri, A., Pudule,

I., Petrauskienė, A., & Breda, J. (2019). Association between Characteristics at Birth, Breastfeeding and Obesity in 22 Countries: The WHO European Childhood Obesity Surveillance Initiative - COSI 2015/2017. *Obesity Facts*, *12*(2), 226-243.

Rollins, N. C., Bhandari, N., Hajeebhoy, N., Horton, S., Lutter, C. K., Martines, J. C., Piwoz, E. G., Richter, L. M., & Victora, C. G. (2016). Why invest, and what it will take to improve breastfeeding practices? *The Lancet*, *387*(10017), 491-504.

Rowlands, I. J., & Redshaw, M. (2012). Mode of birth and women's psychological and physical wellbeing in the postnatal period. *BMC Pregnancy and Childbirth*, *12*, 138.

Ruan Y, Zhang Q, Li J, Wan R, Bai J, & Wang W. (2019) Factors associated with exclusive breast-feeding: A cross-sectional survey in Kaiyuan, Yunnan, Southwest China. *Plos One*, *14*(10).

Rwanda Demographic and Health Survey (RDHS). (2016). Key Findings.

Ryan, A. S., Zhou, W., & Gaston, M. H. (2004). Regional and sociodemographic variation of breastfeeding in the United States, 2002. *Clinical pediatrics*, *43*(9), 815-824.

Sağlam, N. Ö., Bülbül, L., Kazancı, S. Y., and Hatipoğlu, S. S. (2019). Factors Affecting Breastfeeding and Complementary Feeding Choices for Children Aged 24 to 48 Months. *Şişli Hastanesi Tıp Bülteni*, *53*(2), 165-171.

Samartzis, L. (2006). Survival and Censored Data. Infoscience, EPFL Scientific Publications.

Samuelsson, U., & Ludvigsson, J. (2001). Seasonal Variation of Birth Month and Breastfeeding in Children with Diabetes Mellitus. *Journal of Pediatric Endocrinology and Metabolism*, *14*(1).

Sandri, F., Ancora, G., Lanzoni, A., Tagliabue, P., Colnaghi, M., Ventura, M. L., Rinaldi, M., Mondello, I., Gancia, P., Salvioli, G. P., Orzalesi, M., &

Mosca, F. (2004). Prophylactic nasal continuous positive airways pressure in newborns of 28-31 weeks gestation: multicentre randomised controlled clinical trial. *Archives of Disease in Childhood: Fetal and Neonatal Edition*, *89*(5), 394-398.

Sankar, M. J., Sinha, B., Chowdhury, R., Bhandari, N., Taneja, S., Martines, J., & Bahl, R. (2015). Optimal breastfeeding practices and infant and child mortality: a systematic review and meta-analysis. *Acta Paediatrica*, *104*, 3-13.

Şantas, G., & Şantas, F. (2018). Trends of caesarean section rates in Turkey. Journal of obstetrics and gynaecology. *The journal of the Institute of Obstetrics and Gynaecology*, *38*(5), 658-662.

Santos, I., Valle, N. C., Silveira, M. F., Matijasevich, A., Bertoldi, A. D., Domingues, M., Santana, G., Kreutz, I. M., & Barros, F. C. (2020). Twin Births In The Pelotas (Brazil) 2004 And 2015 Birth Cohorts. International Journal of Epidemiology, 48(2), 72-79.

Sarki, M., Parlesak, A., & Robertson, A. (2018). Comparison of national cross-sectional breast-feeding surveys by maternal education in Europe (2006-2016). *Public Health Nutrition*, *22*(5), 848-861.

Scott, J. A., Aitkin, I., Binns, C. W., and Aroni, R. A. (2007). Factors associated with the duration of breastfeeding amongst women in Perth, Australia. *Acta Paediatrica*, *88*(4), 416-421.

Sellen, D. W. (2001). Weaning, Complementary Feeding, and Maternal Decision Making in a Rural East African Pastoral Population. *Journal of Human Lactation*, *17*(3), 233-244.

Sen, K. K., Mallick, T. S., & Bari, W. (2020). Gender inequality in early initiation of breastfeeding in Bangladesh: a trend analysis. *International Breastfeeding Journal*, *15*(1).

Senanayake, P., O'Connor, E. & Ogbo, F.A. (2019). National and rural-urban prevalence and determinants of early initiation of breastfeeding in India. *BMC Public Health*, *19*, 896.

Senarath, U., Dibley, M. J., Godakandage, S. S., Jayawickrama, H., Wickramasinghe, A., & Agho, K. E. (2010). Determinants of Infant and Young Child Feeding Practices in Sri Lanka: Secondary Data Analysis of Demographic and Health Survey 2000. *Food and Nutrition Bulletin*, *31*(2), 352-365.

Şencan, İ., Tekin, O. & Tatli, M.M. (2013). Factors influencing breastfeeding duration: a survey in a Turkish population. *European Journal of Pediatrics*, *172*, 1459-1466.

Shirima, R., Greiner, T., Kylberg, E., & Gebre-Medhin, M. (2001). Exclusive breast-feeding is rarely practised in rural and urban Morogoro, Tanzania. *Public Health Nutrition*, *4*(2), 147-154.

Sholeye, O. O., Abosede, A. O., Salako, A. A. (2015). Exclusive breastfeeding and its associated factors among mothers in Sagamu, Southwest Nigeria. *Journal of Health Science*, *5*(2), 25-31.

Singer, L., Yamashita, T., Lilien, L., Collin, M., & Baley, J. (1997). A longitudinal study of developmental outcome of infants with bronchopulmonary dysplasia and very low birth weight. *Pediatrics*, *100*(6), 987-993.

Singh, G. K., Kogan, M. D., & Dee, D. L. (2007). Nativity/Immigrant Status, Race/Ethnicity, and Socioeconomic Determinants of Breastfeeding Initiation and Duration in the United States, 2003. *Pediatrics*, *119*(1).

Singh, R., & Mukhopadhyay, K. (2011). Survival analysis in clinical trials: Basics and must know areas. *Perspectives in Clinical Research*, *2*(4), 145-148.

Smith, E. R., Hurt, L., Chowdhury, R., Sinha, B., Fawzi, W., & Edmond, K. M. (2017). Delayed breastfeeding initiation and infant survival: A systematic review and meta-analysis. *Plos One*, *12*(7).

Soliman, A. T., Yasin, M., & Kassem, A. (2012). Leptin in pediatrics: A hormone from adipocyte that wheels several functions in children. *Indian Journal of Endocrinology and Metabolism*, *16*(3), 577-587.

Spencer., P. J. (2008). Management of Mastitis in Breastfeeding Women. American Family Physician, 78(6), 727-731.

Stoll, B. J., Hansen, N. I., Bell, E. F., Shankaran, S., Laptook, A. R., Walsh, M. C., Hale, E. C., Newman, N. S., Schibler, K., Carlo, W. A., Kennedy, K. A., Poindexter, B. B., Finer, N. N., Ehrenkranz, R. A., Duara, S., Sánchez, P. J., O'Shea, T. M., Goldberg, R. N., Van Meurs, K. P., & Faix, R. G. (2010). Neonatal outcomes of extremely preterm infants from the NICHD Neonatal Research Network. *Pediatrics*, *126*(3), 443-456.

Stuebe, A. M., Rich-Edwards, J. W., Willett, W. C., Manson, J. E., & Michels, K. B. (2005). Duration of lactation and incidence of type 2 diabetes. *JAMA*, *294*(20), 2601-2610.

Subedi, N., Paudel, S., Rana, T., & Poudyal, A. K. (2012). Infant and young child feeding practices in Chepang communities. *Journal of Nepal Health Research Council*, *10*(21), 141-146.

Sung, H. K., Ma, S. H., Choi, J.-Y., Hwang, Y., Ahn, C., Kim, B.-G., Kim, Y.-M., Kim, J. W., Kang, S., Kim, J., Kim, T. J., Yoo, K.-Y., Kang, D., & Park, S. (2016). The Effect of Breastfeeding Duration and Parity on the Risk of Epithelial Ovarian Cancer: A Systematic Review and Meta-analysis. *Journal of Preventive Medicine and Public Health*, *49*(6), 349-366.

Tadesse, F., Alemayehu, Y., Shine, S., Asresahegn, H., & Tadesse, T. (2019). Exclusive breastfeeding and maternal employment among mothers of infants from three to five months old in the Fafan zone, Somali regional state of Ethiopia: a comparative cross-sectional study. *BMC Public Health*, *19*(1).

Tang, K., Liu, Y., Meng, K., Jiang, L., Tan, S., Liu, Y., & Chen, J. (2019). Breastfeeding duration of different age groups and its associated factors among Chinese women: a cross-sectional study. *International Breastfeeding Journal*, *14*(1).

Tang, L., Binns, C. W., Lee, A. H., Pan, X., Chen, S., & Yu, C. (2013). Low Prevalence of Breastfeeding Initiation within the First Hour of Life in a Rural Area of Sichuan Province, China. *Birth*, *40*(2), 134-142.

Turkish Demographic and Health Survey (TDHS) 2008. (2008). Hacettepe University Institute of Population Studies. Ankara, Turkey.

Turkish Demographic and Health Survey (TDHS) 2013. (2013). Hacettepe University Institute of Population Studies. Ankara, Turkey.

Turkish Demographic and Health Survey (TDHS) 2018. (2018). Hacettepe University Institute of Population Studies. Ankara, Turkey.

Turkish Ministry of Health (MoH). (2020). Baby-Friendly Hospitals.

Turkish Ministry of Health (MoH). (2020). Bebek Dostu/Altın Bebek Dostu İller.

Turkish Ministry of Health (MoH). (2020). Breast Milk Promotion and Baby-Friendly Health Organizations Program.

United Nations International Children's Emergency Fund (UNICEF). (2010). Improving Exclusive Breastfeeding Practices by using Communication for Development in Infant and Young Child Feeding Programmes. UNICEF C4D Orientation Webinar Series. NY, United States.

United Nations International Children's Emergency Fund (UNICEF). (2018). Capture the Moment - Early initiation of breastfeeding: The best start for every newborn. NY, United States.

United Nations International Children's Emergency Fund (UNICEF). (2018). The Why family-friendly policies are critical to increasing breastfeeding rates worldwide. NY, United States.

Usta, E. K. (2020). Effects of Maternal Education on Early Nonmonetary Investments in Child Development. *Journal of Human Capital*, *14*(4), 535-583.

Vanderlinden, K., & Van de Putte, B. (2016). Pathways of equality through education: impact of gender (in)equality and maternal education on exclusive breastfeeding among natives and migrants in Belgium. *Maternal & Child Nutrition*, *13*(2).

Victora, C. G., Bahl, R., Barros, A. J., França, G. V., Horton, S., Krasevec, J., Murch, S., Sankar, M. J., Walker, N., & Rollins, N. C. (2016). Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *The Lancet*, *387*, 475-490

Wardani, E K., Hastuti., U. R. B., & Adriani., R. B. (2017). Relationship Between Sociodemographic Factors and Mother's Participation in Breast Feeding Support Group with Exclusive Breastfeeding Success in Banyuwangi. *Journal of Maternal and Child Health*, *2*(4), 335-344

Warrier, I., Du, W., Natarajan, G., Salari, V., & Aranda, J. (2006). Patterns of drug utilization in a neonatal intensive care unit. *Journal of Clinical Pharmacology*, *46*(4), 449-455.

Woldeamanuel, B. T. (2020). Trends and factors associated to early initiation of breastfeeding, exclusive breastfeeding and duration of breastfeeding in Ethiopia: evidence from the Ethiopia Demographic and Health Survey 2016. *International Breastfeeding Journal*, *15*(1).

Wooldridge, J. M. (2007). Inverse probability weighted estimation for general missing data problems. *Journal of Econometrics*, *141*(2), 1281-1301.

Wooldridge, J. M. (2015). Introductory Econometrics: A Modern Approach. Mason, OH: Thomson/South-Western.

World Bank Group. (2018). Breastfeeding: A Foundational Investment in Human Capital. Blog: Investing in Health.

World Health Organization (WHO). (1985). The Quantity and Quality of Breast Milk. Report of the WHO Collaborative Study on Breastfeeding. Geneva, Switzerland.

World Health Organization (WHO). (1997). WHO Global Database on Child Growth and Malnutrition. Geneva, Switzerland.

World Health Organization (WHO). (2000). Mastitis Causes and Management. Geneva, Switzerland.

World Health Organization (WHO). (2001). Optimal Duration of Exclusive Breastfeeding: Report of an Expert Consultation. Geneva, Switzerland.

World Health Organization (WHO). (2001). The Optimal Duraiton of Exclusive Breastfeeding. Geneva, Switzerland.

World Health Organization (WHO). (2004). Ten Steps to Successful Breastfeeding. Geneva, Switzerland.

World Health Organization (WHO). (2004). Infant Feeding and Breastfeeding. Geneva, Switzerland.

World Health Organization (WHO). (2006). Optimal Feeding of Low-Birth-Weight Infants: Technical Review. Geneva, Switzerland.

World Health Organization (WHO). (2008). Improving Exclusive Breastfeeding Practices. Geneva, Switzerland.

World Health Organization (WHO). (2011). Annual report, 12,000 fewer children perish daily in 2010 than 1990. Geneva, Switzerland.

World Health Organization (WHO). (2013). Recommendations for Postnatal Care of the Mother and Newborn. Geneva, Switzerland.

World Health Organization (WHO). (2015). WHO Statement on Caesarean Section Rates. Geneva, Switzerland.

World Health Organization (WHO). (2015). Trends in maternal mortality: 1990 to 2015. Geneva, Switzerland.

World Health Organization (WHO). (2016). Guideline: Updates on HINV and Infant Feeding: The duration of breastfeeding, and support from health

services to improve feeding practices among mothers living with HIV. Geneva, Switzerland.

World Health Organization (WHO). (2017). Tracking Progress for Breastfeeding Policies and Programmes. Geneva, Switzerland.

World Health Organization (WHO). (2019). Breastfeeding of low-birth-weight infants. Geneva, Switzerland.

World Health Organization. (2019). Breastfeeding of low-birth-weight infants. Geneva, Switzerland.

World Health Organization (WHO). (2020). Breastfeeding. Geneva, Switzerland.

Xue, X., Xie, X., Gunter, M., Rohan, T. E., Wassertheil-Smoller, S., Ho, G. Y. F., Cirillo, D., Yu, H., & Strickler, H. D. (2013). Testing the proportional hazards assumption in case-cohort analysis. *BMC Medical Research Methodology*, *13*(1).

Yeboah, J. Y., Forkuor, D., & Agyemang-Duah, W. (2019). Exclusive breastfeeding practices and associated factors among lactating mothers of infants aged 6-24 months in the Kumasi Metropolis, Ghana. *BMC Research Notes*, *12*(1).

Yeşinel., S. (2007). Çok Düşük Doğum Ağırlıklı Riskli Prematürelerin Somatik Gelişimlerine Etki Eden Faktörler. Sağlık Bakanlığı Bakırköy Doğumevi Kadın ve Çocuk Hastalıkları Eğitim ve Araştırma Hastanesi. Thesis of Medical Expertise.

Yisma, E., Smithers, L. G., Lynch, J. W., & Mol, B. W. (2017). Cesarean section in Ethiopia: prevalence and sociodemographic characteristics. *The Journal of Maternal-Fetal & Neonatal Medicine*, *32*(7), 1130-1135.

Zhao, J., Zhao, Y., Du, M., Binns, C. W., & Lee, A. H. (2017). Maternal education and breastfeeding practices in China: A systematic review and meta-analysis. *Midwifery*, *50*, 62-71.

APPENDICES

A. ADDITIONAL TABLES

Table A. 1. Description of Variables

Variable Name	Definition
Independent Variables	
Child Characteristics	
Female	It is a dichotomous variable indicating the sex of the last-born children. 0=Males 1= Females.
Birth Year	It is a discrete variable showing the birth year of the last-born children. The children are born five years preceding the survey. Therefore, the minimum year of birth for children included in the TDHS-2008 is 2003 while it is 2008 for children included in the THDS-2013. In this thesis, it is used as a fixed effect to control for the differences across (birth) years.
Birth Month	It is a discrete variable implying the birth month of the children. In this thesis, it is used as a fixed effect to control for the seasonal changes.
Birth Weight (in kilograms)	It is a continuous variable measured in kilograms. In the TDHS, the mothers are asked whether their children's weight at birth is measured. Those who replied "Yes" are then requested to indicate the weight at birth.

Table A.1. (Continued)

Mother Characteristics	
Age (in years)	It is a continuous variable indicating the ages of eligible and successfully interviewed mothers, who gave birth five years preceding the survey. In the TDHS, mothers are asked to report their ages in years. Thus, the variable age is indeed self-reported. However, it should be noted that maternal age is included in the regression analyses as a categorical variable as follows: 1=15-19 2=20-24 3=25-29 4=30-34 5=35-39 6=40-44 7=45-49
Education (in years)	It is a discrete variable showing the completed year(s) of education. This variable is formed using the information collected from a) the highest educational level attended and b) the highest year of education completed at the reported level. Mothers are first asked the highest educational level and then they are requested to indicate the year that they completed at that level. As a result, years of education can be computed by summing the completed grades. However, it should be noted that education (in years) is not used in the regression analyses. Rather, education level is used following Jayachandran and Kuziemko (2011).

Table A.1. (Continued)

Education (Level)	It is a categorical variable showing the level of education. 1= No Education / Primary School Incomplete 2= Complete Primary School 3= Complete Secondary School 4= High School and Higher
Household Characteristics	
De Jure # of Members	This variable comes from the Household Survey. It stands for the total de jure number of household members. That is, it represents the total number of household members that usually reside in the household.
De Facto # of Members	This variable comes from the Household Survey. It stands for the total number of de facto household members. That is, it represents the number of household members that stayed in the household the one night prior to the interview. Thus, it also includes the visitors. In our analyses, we only consider the adult persons in the household (i.e., aged 18 and older).
Total # of Births	This variable shows the total number of births. It does not only consider the births in the last five years. Instead, it includes all births of the mothers.
Total # of (Older) Siblings	This variable shows the total number of (older) siblings that the last-born children have. It is calculated as follows: Total Number of (Older) Siblings = Total Births – 1 It should be noted that the variable takes value of zero if the last-born children have no (older) sibling.

Table A.1. (Continued)

Male Fraction of (Older) Siblings	This variable shows the male fraction of (older) siblings that the last-born children have. It is calculated as follows: Male Fraction of (Older) Siblings= Number of (older) male siblings / Total Number of (Older) Siblings It should be noted that the variable takes the value of zero if the last-born children have no (older) male sibling.
Ideal # of Children	In the TDHS, the mothers are asked the following question: "How many child(ren) would you like to have in total if you can go back to days when you have no child(ren)?" The answers are recorded in numbers. This variable is used to calculate the "Distance from Ideal Fertility" which is a proxy of the mother's fertility preferences. Thus, it is not included in the empirical analyses directly.
Distance from Ideal Family Size (Ideal Distance)	This variable is constructed as follows: Distance from Ideal Family Size = Total Number of Births – Ideal Number of Children It should be acknowledged that this variable added to the empirical analyses following Jayachandran and Kuziemko (2011).

Table A.1. (Continued)

Wealth Index	The wealth index can be regarded as a composite measure of a household's overall standard of living. It considers several household characteristics including heating system (e.g., natural gas, coal, and air conditioner), ownership of some consumer durables (e.g., television and car), materials and equipment used for the household construction, and type of access to basic needs (e.g., water). It is generated by using the Principal Component Analysis (PCA) as having five wealth quintiles to compare the effect of wealth on various outcomes such as health and nutrition. In this thesis, it is used as a proxy for permanent household income. The wealth index variable has five categories as follows: 1= Poorest 2= Poorer 3= Middle 4= Rich 5= Richest
Regional Characteristics	
Rural	This variable indicates the (de facto) type of place of residence. Rural/Urban Residence has two categories: 1=Rural 0=Urban
Five Regions	This variable categorically indicates the five regions of Turkey as follows: 1= West 2= South 3= Central 4= North 5= East

Source: Author's own calculations based on the TDHS.

Table A. 2. Descriptive Statistics for Children by Age

Variable	Obs	Mean	Obs	Mean	Total Obs.
	Children < 36 Months		Children ≥ 36 Months		
Dependent Variable					
Breastfeeding Duration	3828	10.897 (7.486)	1733	16.638 (10.382)	5561
Independent Variables					
Year	3836	2010.409 (2.499)	1735	2010.519 (2.501)	5571
Child Characteristics					
Female	3836	.49 (.5)	1735	.458 (.498)	5571
Birth Year	3836	2009.363 (2.626)	1735	2006.931 (2.548)	5571
Birth Month	3836	6.44 (3.339)	1735	6.489 (3.317)	5571
Birth Weight (in kilograms)	3422	3.213 (.658)	1520	3.204 (.707)	4942
Birth Weight (category)	3422	1.927 (.442)	1520	1.907 (.483)	4942
Mother Characteristics					
Age (in years)	3836	28.374 (5.697)	1735	31.796 (5.729)	5571
Age (interval)	3836	3.282 (1.173)	1735	3.956 (1.187)	5571
Education (in years)	3836	6.119 (4.223)	1735	6.151 (4.093)	5571
Household Characteristics					
De Jure # of Members	3836	2.863 (1.583)	1735	2.647 (1.334)	5571
De Facto # of Members	3836	2.948 (1.615)	1735	2.717 (1.361)	5571
Total # of Births	3836	2.597 (1.855)	1735	2.728 (1.838)	5571
Total # of (Older) Siblings	3836	1.597 (1.855)	1735	1.728 (1.838)	5571
Male Fraction of (Older) Siblings	3836	.346 (.412)	1735	.397 (.419)	5571

Table A.2. (Continued)

Ideal # of Children	3795	2.834	1716	2.804	5511
		(1.286)		(1.345)	
Distance from Ideal	3795	-.256	1716	-.104	5511
Fertility		(1.866)		(1.772)	
Wealth Index	3836	2.598	1735	2.78	5571
		(1.368)		(1.381)	
Regional Characteristics					
Rural	3836	.297	1735	.259	5571
		(.457)		(.438)	
Five Regions	3836	3.381	1735	3.156	5571
		(1.556)		(1.545)	

Source: Author's own calculations based on the TDHS-2008 and TDHS-2013.

Notes: Standards Deviations (SDs) are in parenthesis.

Table A. 3. Descriptive Statistics for EBF Status (Children Aged 6-59 Months)

Variable	Obs	Mean	Obs	Mean	Total Obs
	Exclusively Breastfed		Not Exclusively Breastfed		
Child Characteristics					
Female	757	.458 (.499)	1718	.493 (.5)	2475
Birth Year	757	2005.851 (1.301)	1718	2005.971 (1.3)	2475
Birth Month	757	6.497 (3.563)	1718	6.172 (3.467)	2475
Birth Weight (in kilograms)	644	3.267 (.692)	1385	3.208 (.73)	2029
Birth Wight (Category)	644	1.941 (.466)	1385	1.917 (.488)	2029
Mother Characteristics					
Age (in years)	757	28.988 (5.698)	1718	29.389 (6.092)	2475
Age (Interval)	757	3.407 (1.163)	1718	3.476 (1.256)	2475
Education (in years)	757	5.902 (3.881)	1718	5.463 (4.014)	2475
Household Characteristics					
De Facto # of Members	757	2.848 (1.547)	1718	2.921 (1.602)	2475
Total # of (Older) Siblings	757	1.577 (1.769)	1718	1.761 (2.025)	2475
Male Fraction of (Older) Siblings	757	.363 (.418)	1718	.359 (.407)	2475
Distance from Ideal Fertility	747	-.062 (1.665)	1693	.049 (1.985)	2452
Wealth Index	757	2.741 (1.358)	1718	2.62 (1.375)	2475
Regional Characteristics					
Rural	757	.255 (.436)	1718	.314 (.464)	2475
Five Regions	757	3.266 (1.57)	1718	3.366 (1.55)	2475

Source: Author's own calculations based on the TDHS-2008.

Notes: Standard Deviations (SDs) are in parenthesis.

Table A. 4. OLS Results on Breastfeeding Duration (Children Aged 3-5 Years) with Fixed Effects

VARIABLES	BF Duration
2013	2.710
	(1.844)
Child Characteristics	
Sex (Base: Male)	
Female	-1.126**
	(0.556)
Birth Year (Base: 2003)	
2004	1.272
	(1.778)
2005	0.781
	(1.852)
2008	-1.203
	(1.982)
2009	-1.600*
	(0.848)
Birth Month (Base: January)	
February	0.621
	(1.558)
March	-1.497
	(1.423)
April	-1.439
	(1.248)
May	-1.267
	(1.391)
June	-1.377
	(1.369)
July	1.419
	(1.456)
August	-1.540
	(1.304)
September	-0.380
	(1.257)
October	-0.326
	(1.499)

Table A.4. (Continued)

November	-1.280
	(1.447)
December	0.699
	(1.486)
Birth Weight (Base: LWB)	
Normal BW (2.5-4 kgs)	2.391***
	(0.882)
High BW (4+ kgs)	2.618*
	(1.393)
Missing BW	1.344
	(1.166)
Mother Characteristics	
Age (Base: 15-19)	
25-29	-0.411
	(1.115)
30-34	0.402
	(1.192)
35-39	2.259*
	(1.326)
40-44	1.547
	(1.520)
45-49	0.814
	(2.539)
Education Level (Base: Incomplete Primary/No Education)	
Complete Primary	0.0828
	(0.856)
Complete Secondary	-0.0481
	(1.170)
Complete HS and Higher	0.227
	(1.150)
Household Characteristics	
Household Composition	
De Facto Members	0.598***
	(0.227)
Total # of (Older) Siblings	1.104***
	(0.296)
Male Fraction (Older) of Siblings	0.719
	(0.676)

Table A.4. (Continued)

Ideal Distance	-0.468*
	(0.239)
Household Wealth (Base: the Poorest)	
Poorer	-2.181**
	(0.917)
Middle	-0.423
	(1.028)
Rich	-2.281**
	(1.123)
Richest	-2.798**
	(1.242)
Regional Characteristics	
Type of Place of Residence (Base: Urban)	
Rural	0.844
	(0.771)
Regional Residence (Base: West)	
South	-1.867**
	(0.780)
Central	-0.148
	(0.833)
North	-2.257**
	(0.932)
East	0.320
	(0.801)
Constant	11.58***
	(2.745)
Observations	1,714
R-squared	0.101

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A. 5. Cox Regression Results for Breastfeeding (All Children) with Fixed Effects

VARIABLES	BF Duration
2013	-0.106***
	(0.0400)
Child Characteristics	
Sex (Base: Male)	
Female	0.137***
	(0.0383)
Birth Year (Base: 2003)	
2004	-0.0744
	(0.198)
2005	-0.0483
	(0.197)
2006	0.0229
	(0.196)
2007	-0.00550
	(0.202)
2008	-0.0567
	(0.241)
2009	-0.485
	(0.300)
2010	-0.565
	(0.300)
2011	-0.467
	(0.300)
2012	-0.595*
	(0.307)
2013	-0.446
Birth Month (Base: January)	
February	0.0658
	(0.0929)
March	0.0370
	(0.0841)
April	-0.0203
	(0.0865)
May	0.0557
	(0.0913)

Table A.5. (Continued)

June	0.173*
	(0.0899)
July	-0.0985
	(0.0922)
August	0.0747
	(0.0870)
September	0.0852
	(0.0869)
October	0.0685
	(0.0927)
November	0.111
	(0.0859)
December	0.0225
	(0.0891)
Birth Weight (Base: LBW)	
Normal BW (2.5-4 kgs)	-0.255***
	(0.0640)
High BW (4+ kgs)	-0.224**
	(0.0905)
Missing BW	-0.205**
	(0.0809)
Mother Characteristics	
Age (Base: 15-19)	
20-24	-0.0985
	(0.206)
25-29	-0.0968
	(0.205)
30-34	-0.141
	(0.210)
35-39	-0.252
	(0.214)
40-44	-0.299
	(0.225)
45-49	-0.302
	(0.279)
Education Level (Base: Incomplete Primary/No Education)	
Complete Primary	0.0784
	(0.0557)

Table A.5. (Continued)

Complete Secondary	0.112
	(0.0748)
Complete HS and Higher	0.0839
	(0.0756)
Household Characteristics	
Household Composition	
De Facto Members	-0.0201
	(0.0140)
Total # of (Older) Siblings	-0.0821***
	(0.0216)
Male Fraction (Older) of Siblings	-0.0999**
	(0.0473)
Ideal Distance	0.0385**
	(0.0178)
Household Wealth (Base: the Poorest)	
Poorer	0.127**
	(0.0611)
Middle	0.0334
	(0.0681)
Rich	0.157**
	(0.0757)
Richest	0.294***
	(0.0868)
Regional Characteristics	
Type of Place of Residence (Base: Urban)	
Rural	-0.0253
	(0.0489)
Regional Residence	
South	0.238***
	(0.0575)
Central	-0.0510
	(0.0554)
North	0.0467
	(0.0650)
East	-0.0167
	(0.0537)
Observations	78,749

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table A. 6. LPM Results on the EBF Status (Children Aged Above 6-Month) with Fixed Effects

VARIABLES	EBF Status
Child Characteristics	
Sex (Base: Male)	
Female	-0.0273
	(0.0226)
Birth Year (Base: 2003)	
2004	-0.0467
	(0.103)
2005	-0.0703
	(0.102)
2006	-0.0555
	(0.102)
2007	-0.0398
	(0.101)
2008	-0.0834
	(0.109)
Birth Month (Base: January)	
February	0.00176
	(0.0535)
March	-0.0683
	(0.0517)
April	-0.0972*
	(0.0476)
May	-0.00954
	(0.0568)
June	-0.0918
	(0.0535)
July	0.0795
	(0.0595)
August	-0.0611
	(0.0528)
September	-0.00329
	(0.0562)
October	0.00461
	(0.0574)
November	-0.0107
	(0.0563)

Table A.6. (Continued)

December	-0.0347
	(0.0554)
Birth Weight	
Normal BW (2.5-4 kgs)	0.0179
	(0.0364)
High BW (4+ kgs)	-0.0169
	(0.0530)
Missing BW	-0.0196
	(0.0428)
Mother Characteristics	
Age (Base: 15-19)	
20-24	-0.0585
	(0.0845)
25-29	0.0336
	(0.0858)
30-34	-0.00148
	(0.0881)
35-39	-0.0380
	(0.0933)
40-44	-0.0468
	(0.103)
45-49	0.00623
	(0.136)
Education Level (base: Incomplete Primary/No Education)	
Complete Primary	0.0323
	(0.0328)
Complete Secondary	0.141***
	(0.0518)
Complete HS and Higher	0.0324
	(0.0484)
Household Characteristics	
Household Composition	
De Facto Members	-0.00396
	(0.00774)
Total # of (Older) Siblings	-0.00622
	(0.0116)
Male Fraction (Older) of Siblings	-0.00958
	(0.0287)

Table A.6. (Continued)

Ideal Distance	0.00653
	(0.00906)
Household Wealth (Base: the Poorest)	
Poorer	0.00717
	(0.0346)
Middle	-0.0249
	(0.0393)
Rich	0.0338
	(0.0447)
Richest	-0.0198
	(0.0538)
Regional Characteristics	
Type of Place of Residence (Base: Urban)	
Rural	-0.0557**
	(0.0267)
Regional Residence (Base: West)	
South	0.0887**
	(0.0365)
Central	-0.00591
	(0.0342)
North	-0.00735
	(0.0386)
East	0.0452
	(0.0325)
Constant	0.381**
	(0.149)
Observations	2,440
R-squared	0.037

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A. 7. Cox Regression Results on the EBF (All Children) with Fixed Effects

VARIABLES	EBF Duration
Child Characteristics	
Sex (Base: Male)	
Female	0.0109
	(0.0386)
Birth Year (Base: 2003)	
2004	0.170
	(0.177)
2005	0.244
	(0.177)
2006	0.185
	(0.176)
2007	0.200
	(0.173)
2008	0.394**
	(0.180)
Birth Month (Base: January)	
February	-0.000148
	(0.0909)
March	0.0925
	(0.0936)
April	0.140
	(0.0901)
May	0.0755
	(0.0932)
June	0.189*
	(0.0925)
July	-0.0298
	(0.0907)
August	0.105
	(0.0937)
September	0.123
	(0.0902)
October	0.0828
	(0.0920)
November	0.0267
	(0.0989)

Table A.7. (Continued)

December	0.106
	(0.103)
Birth Weight (Base: LWB)	
Normal BW (2.5-4 kgs)	-0.0902
	(0.0631)
High BW (4+ kgs)	-0.0316
	(0.0944)
Missing BW	-0.115
	(0.0852)
Mother Characteristics	
Age (Base: 15-19)	
20-24	-0.0218
	(0.129)
25-29	-0.126
	(0.128)
30-34	-0.111
	(0.132)
35-39	-0.0123
	(0.145)
40-44	0.0967
	(0.177)
45-49	0.0123
	(0.241)
Education Level (Base: Incomplete Primary/No Education)	
Complete Primary	-0.125**
	(0.0569)
Complete Secondary	-0.280***
	(0.0819)
Complete HS and Higher	-0.113
	(0.0781)
Household Characteristics	
Household Composition	
De Facto Members	0.0212*
	(0.0122)
Total # of (Older) Siblings	0.00284
	(0.0212)
Male Fraction (Older) of Siblings	0.0216

Table A.7. (Continued)

	(0.0464)
Ideal Distance	-0.00486
	(0.0177)
Household Wealth (Base: the Poorest)	
Poorer	0.0195
	(0.0592)
Middle	0.105
	(0.0680)
Rich	0.0428
	(0.0751)
Richest	0.110
	(0.0871)
Regional Characteristics	
Type of Place of Residence (Base: Urban)	
Rural	0.141***
	(0.0466)
Regional Residence (Base: West)	
South	-0.138**
	(0.0604)
Central	-0.0113
	(0.0550)
North	-0.00524
	(0.0643)
East	-0.116**
	(0.0583)
Observations	11,544

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

B. TURKISH SUMMARY / TÜRKÇE ÖZET

Anne sütü, yeni doğan beslemenin en sağlıklı, masrafsız ve biyolojik olarak en ideal yoludur. Anne sütü, ikameleriyle (örneğin, bebek maması) karşılaştırıldığında, hem anneler hem de yavruları için sayısız faydaya sahiptir. Anne sütü, tıp literatüründe her biri immünoglobulinler olarak bilinen IgA, IgM ve IgG gibi çeşitli antikorlar içerir. Bebeklerin dolaşım sisteminde bu tür bağışıklık güçlendirici antikorların varlığı, kulak, burun, boğaz ve bağırsaklarında bir koruyucu bir katman oluşturmaktadır. Bu koruyucu katman, yeni doğan bebekleri doğumdan sonraki ilk 28 gün içinde meydana gelen ani yeni doğan ölümlülüğüne ve çeşitli hastalıklara karşı korur. Bahsedilen bu çeşitli hastalıklar arasında aşırı kilolu olma, obezite, tip I diyabet, virüs veya bakteri kaynaklı üst/alt solunum yolu enfeksiyonları, ani bebek ölümü sendromu, ishal, gastrointestinal inflamasyon ve bir takım bulaşıcı hastalık bulunmaktadır (Hastalık Kontrol ve Önleme Merkezleri (CDC), 2020; Alshammari ve Haridi, 2021).

Daha da önemlisi, anne sütünün bilişsel ve davranışsal gelişim üzerinde göz ardı edilemeyecek etkileri bulunmaktadır. Bilişsel ve davranışsal gelişimin bir kısmı kalıtımla (veya genetik aktarımla) açıklansa da anne sütünün çocukların entelektüel yeterliliğindeki rolünün çok önemli olduğu annelerin eğitim durumu kontrol edildikten sonra bile gösterilmiştir (Bartels ve diğerleri, 2009; Lee ve diğerleri, 2016).

Emzirme eyleminden elde edilebilecek sağlık faydalarının, emzirmeye başlama süresi, yaşamın ilk altı ayında sadece anne sütüyle beslenme ve emzirmeye doğru bir diyet uygulayarak iki yaşa kadar devam edilmesi ile doğrudan bağlantısı vardır. Daha açık olmak gerekirse, DSÖ ve UNICEF'e (2020) göre anneler doğumdan sonraki ilk bir saat içinde emzirmeye başlamalı, yaşamın ilk altı ayı boyunca bebeğini yalnızca anne sütü ile beslemeli ve uygun bir beslenme düzeni çerçevesinde çocukları iki yaşına gelene dek emzirmeye devam etmelidir. Bu nedenle, emzirme eyleminden maksimum kazanç elde edebilmek için evrensel

önerilere sadık kalmak çok önemlidir. Bu noktada, özellikle sadece anne sütü ile beslenme ve emzirmeye devam etme süresi birçok açıdan fayda sağlamaktadır. Bununla birlikte, söz konusu faydalar yalnızca sağlık hizmeti kullanımının maliyetlerini azaltmakla veya sayısız hastalığın önlemekle ile ilgili değildir. Aksine, ekonomilerini uzun vadede yönetecek beşerî sermayenin oluşturulmasıyla da önemli ölçüde bağlantılıdır. Bu kapsamda Der ve arkadaşları (2006), yaşamın ilk altı ayında sadece anne sütü ile beslenmenin ve uzun süreli emzirmenin, zekâ ve yetenek sınavlarında daha yüksek puanlar almanın ilgisi olduğuna vurgu yapmaktadır. Yani uzun süreli emzirme eylemi, akademik performansı pozitif yönde etkileyerek, bireylerin gelecekteki potansiyel kazançlarını attırır ve bu da sürdürülebilir ekonomik büyümeye ulaşmanın dolaylı ama güçlü bir yolunu oluşturabilir. Bu noktada Dünya Sağlık Örgütü (DSÖ) (2017), kısa süreli emzirme oranları nedeniyle ülkelerin yılda yaklaşık 300 milyar Amerikan Doları kaybettiğini ileri sürüyor ki bu da Gayri Safi Milli Gelirin yüzde 0,48'ine tekabül ediyor. Bu nedenle emzirme uygulamalarını iyileştirmeye yönelik her türlü kampanya ve/veya politikanın beşerî sermaye birikimine ve dolayısıyla makroekonomik göstergelere pozitif yönde katkı sağlama olasılığı yüksektir.

Türkiye Cumhuriyeti Sağlık Bakanlığı (SB) 1991 yılından bu yana emzirme oranlarını artırmak için adımlar atmaktadır. 1991 yılında Sağlık Bakanlığı, DSÖ'nün tavsiyeleri doğrultusunda anne sütü ile beslenmeyi teşvik etmek adına "Anne Sütünü Geliştirme ve Bebek Dostu Sağlık Kuruluşları Programı"nı başlatmıştır. Bu kapsamda Sağlık Bakanlığı, anne adaylarının emzirmenin karşılıklı yararları konusunda daha gebeliğin başından itibaren bilgilendirildiği "Anne ve Bebek Dostu Hastaneler" kurmaya başlamıştır. Bu hastanelerde, anne adaylarını hamileliğin başlangıcından itibaren uygun emzirme tekniklerini öğretmekle sorumlu eğitimli ebe ve hemşireler bulunmaktadır. Türkiye genelinde 61 il, mevcut sayısı 1.302 olan ve yılda 452.000 doğumun gerçekleştiği "Anne ve Bebek Dostu Hastaneler"'e ev sahipliği yapmaktadır (SB, 2019, 2020). Daha net olmak gerekirse, Türkiye'deki toplam doğumların %56,0'ı bu "Anne ve Bebek Dostu Hastaneler"'de gerçekleşmektedir (SB, 2020). Ayrıca Sosyal Güvenlik Kurumu (SGK) 2019 yılından itibaren aylık olarak "emzirme yardımı" vermeye

başlamıştır. Sigorta primlerini belirli bir süre ödeyen işçi ve memurlara aylık 232 Türk Lirası (TL) ödeme yapılmaktadır.

Fakat, Sağlık Bakanlığı'nın tüm çabalarına rağmen emzirme uygulamalarına ilişkin istatistikler umut verici olmaktan uzaktır. Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü (HÜİPS) verilerine göre (HÜİPS, 2003, 2008, 2013, 2018) medyan emzirme süresi yıllara göre şu şekilde kaydedilmiştir: 1998 yılında 11,9 ay, 2003 yılında 14,1 ay, 2008'de 16,0 ay, 2013'te 15,7 ay ve 2018'de 16,7 ay (yani medyan aylar, anket yılından 3 yıl önce doğan çocukları içermektedir). Buna karşılık, 1998'den 2018'e dek yaşamın ilk altı ayında sadece anne sütü ile beslenme oranlarındaki iyileşme dikkat çekici olsa da (yani, 1998'de %14,0, 2003'te %20,80, 2008'de %41,60, 2013'te %30,10 ve 2018'de %41,70), Türkiye hala diğer orta gelirli ülkelerin çok gerisindedir. Dolayısıyla Türkiye'nin evrensel hedeflere ulaşmak için uzun bir yolu olduğu görülmektedir.

Emzirme uygulamalarının bağıntılarını (yani, münhasırlığı ve süresi) anlamak ve böylece ülke genelinde yaygınlığını artırmak için araştırmacılar çeşitli çalışmalar yaptı. Bu araştırmanın önemli bir kısmı, verilerin daha önce hastanelerin pediatri kliniklerini ziyaret eden annelerden toplandığı tıp literatüründen gelmektedir (örn., Yeşinel, 2007; Şencan, Tekin ve Tatlı, 2013; Eren ve ark., 2018). Araştırmalarında kullanılan veriler, nüfus düzeyinde çıkarımlar yapmaya uygun olmadığından, elde edilen bulgular sağlık uzmanları ve politika yapıcılar için emzirme oranlarını artırma konusunda verimli bilgiler oluşturmayabilir. Bu noktada HIPS, 1993 yılından bu yana Türkiye Nüfus ve Sağlık Araştırmaları (TNSA) adı altında ulusal düzeyde temsili bir veri sunmaktadır (HIPS, 2003, 2008, 2013, 2018). Veriler, 15-49 yaş arasında olan ve daha önce evlenmiş kadınlardan toplanmıştır. Söz konusu verilerin kapsamı oldukça geniştir. Kadınların temel demografik bilgilerinden, doğum geçmişlerine ve dünyaya getirdiği çocuklarının çeşitli sağlık göstergelerine kadar çeşitli konularda bilgi içermektedir. Ekonomi literatüründe Usta (2020) dışında emzirme uygulamalarının belirleyicilerini ortaya çıkarmak için TNSA serisi kullanılarak ampirik bir analiz yapılmamıştır. Bu kapsamda, Usta (2020) sadece annelerin okullaşmasını emzirme süresinin potansiyel bir belirleyicisi

olarak görmektedir. Diğer olası faktörleri (yani, çocuğun cinsiyeti, annelerin yaşı ve/veya hanehalkı bileşimi değişkenleri) araştırmasında dikkate alınmamıştır. Dolayısıyla, yaşamın ilk altı ayı boyunca yalnızca anne sütü ile beslenmenin ve emzirmenin süresinin belirleyicileri üzerine Türk popülasyonu temsil eden ampirik bir çalışma yoktur demek doğru olacaktır. Bu yüzden bu tezin ana amacı literatürde bulunan bu eksiğin tamamlanmasına katkıda bulunmaktır.

İlk olarak, emzirme eylemini teşvik etmek üzere tasarlanmış ve halihazırda yürürlükte olan politikaların küresel hedeflere ulaşma konusunda yeterli olmadığını inanıyoruz. Söz konusu yetersizliğin, ülke düzeyinde sağlam ve güvenilir bulguların olmamasından kaynaklı olabileceğini düşünüyoruz. Diğer bir deyişle, literatürdeki mevcut çalışmalar Türk nüfusunu temsil etmemektedir, bu da emzirme oranlarını artırmaya yönelik politikaların etkinliğini olumsuz yönde etkileme potansiyeline sahiptir. Bu nedenle, bireysel düzeyde ve enlemesine veri sağlayan TNSA anketlerinin 2008 ve 2013 dalgalarını kullanarak, emzirme uygulamalarının belirleyicilerini ortaya çıkarmayı amaçlıyoruz. Bu kapsamda, her ikisi de annelerin en küçük çocuğu (yani son doğan çocukları) için tanımlanan iki bağımlı değişken vardır. Birincisi, annenin yavrularını emzirdiğini bildirdiği aylar ile ölçülen emzirme süresidir. İkincisi ise çocukların yaşamının ilk altı ayında sadece anne sütüyle beslenip beslenmediğini gösteren ikili bir değişkendir.

Bu tezde kullanılan veriler, her ikisi de Türkiye popülasyonunu temsil eden, Hacettepe Üniversitesi Nüfus Etütleri Enstitüsü (HÜİPS) tarafından 2008 ve 2013 yıllarında yapılan Türkiye Nüfus Sağlığı Araştırması'nın (TNSA) anketlerinden elde edilmiştir. TNSA, HÜİPS tarafından 1968'den yılından bu yana her beş yılda bir yapılmaktadır. HÜİPS, 1968'den 1993 yılına kadar, güvenilir, zengin ve karşılaştırılabilir demografik bilgiler sağlamayı amaçlayan bir dizi anket yapmıştır. Bu araştırmalar, 1968 yılından 1993 yılına dek Türkiye Cumhuriyeti Sağlık Bakanlığı ile birlikte farklı isimler altında yürütülmüştür. Ancak, 1993 yılı ve sonrasında standart Nüfus ve Sağlık Araştırmaları (DHS) Programı prensipleri izlenmiştir ve anketler ona göre yapılmıştır. Bugün, HÜİPS anketleri sayesinde yaklaşık 50 yıllık bir zaman dilimini kapsayan demografik değişimlerin izini

sürmek mümkün hale geldi. DHS Programı, mevcut sayıları 90'ın üzerinde olan orta gelirli ve gelişmekte olan ülkelerdeki sağlık, beslenme ve nüfus göstergelerine ilişkin ulusal düzeyde temsili verileri toplamayı ve analiz etmeyi amaçlamaktadır (DHS Programı, 2021).

TNSA 2008 ve 2013 anketlerinde kullanılan örneklem, çok aşamalı, tabakalı küme örnekleme metodu ile tasarlanmıştır. TNSA araştırmacılara aşağıdaki düzeylerde veri sağlamaktadır: ikamet yeri türü (yani, kırsal ve kentsel ikameti), Türkiye'nin beş bölgesi (yani, Batı, Güney, Orta, Kuzey ve Doğu) ve 12 bölge Türkiye İstatistik Bölge Birimleri Birinci Düzey İsimlendirmesi (yani, İBBS-1). Türkiye bağlamında, daha önce kadınların ve çocukların demografik özelliklerinin çeşitli sosyoekonomik sonuçlar üzerindeki etkisini değerlendirmeyi amaçlayan birçok araştırmacı için mükemmel bir veri kaynağı olmuştur. Örneğin, Dayıoğlu, Kırdar ve Tansel (2009), 1998 yılında yapılan TNSA anketini kullanarak hanehalkı kompozisyonunun (doğum sırası, kardeş büyüklüğü ve kardeş cinsiyet kompozisyonu) kentsel bölgede yaşayan çocukların okullaşma sonuçlarını nasıl etkilediğine dair kanıtlar sunmaktadır. Daha yakın zamanlarda, Karaoğlan ve Saraçoğlu (2018), ebeveynlerin sosyoekonomik göstergelerinin (ebeveyn eğitimi, ikamet bölgesi, hane büyüklüğü, yaşam koşulları dahil olmak üzere çeşitli değişkenlerle ölçülen) çocukların sağlık sonuçları üzerindeki etkisini araştırmak için 2013 yılında yapılan TNSA anketini kullanmaktadır.

Bu tezde kullanılan ilk bağımlı değişken olan "Emzirme Süresi"'dir. Bu değişken, anket yılından önceki son beş yılda doğan beş yaş altı çocuklar için sürekli değişken olarak ve ay cinsinden tanımlanmıştır. TNSA'da annelere son doğan çocukları için "Çocuğunuzu kaç ay emzirdiniz?" sorusu sorulmaktadır. Cevaplar ise anketörler tarafından üç şekilde kaydedilmektedir: 1) Anneler, çocuğu sütten kesilmişse tam olarak emzirme ayını belirterek soruyu yanıtlayabilirler, 2) Eğer çocuk hala anne sütü alıyorsa, anne "hala anne sütüyle besleniyor" şeklinde cevap verebilir ve 3) çocuk hiç anne sütü almamışsa, "hiç emzirilmedi" şeklinde cevap verebilirler. Bu cevapları analize hazır hale getirmek için, hali hazırda anne sütü alan çocuklar için emzirme süresi değişkeni çocuğun yaşı (ay olarak) ile

değiştirilmiştir. Aynı şekilde doğumdan beri hiç anne sütü almayan çocukların değerleri sıfır ile değiştirilmiştir. Orijinal verilerde hiç anne sütü ile beslenmeyen çocuk sayısının 107 (havuzlanmış örneklemin %1,04'ünü oluşturmaktadırlar. Bu bağlamda 53 tanesi TNSA-2008'den, geri kalanı ise TNSA-2013'ten gelmektedir) olduğunu belirtmekte fayda var. Ayrıca 0 aylık olan tüm çocukların istisnasız anne sütü ile beslenmeye devam ettiğini belirtmek önemlidir (0 aylık çocuk sayısı 35'tir). Hiç anne sütü almayan çocukları, henüz 0 aylık olan çocuklardan ayırt etmek için, 0 aylık çocukların değerleri 1 ile değiştirilmiştir. Bu spesifikasyona göre beş yaş altı çocukların ortalama emzirme süresi 12.68 ay (SD=8.90) olarak bulunmuştur.

Henüz sütten kesilmemiş çocukların varlığından dolayı yukarıda bahsedilen spesifikasyonun emzirme süresini yakalamada başarısız olabileceği iddia edilebilir. Başka bir deyişle, emzirme süresi değişkeni, tamamlanmış emzirmeyi (yani, sütten kesilmiş çocuklar) devam eden emzirmeden (yani, şu anda emzirilen çocuklar) ayırt etmez. Bu, emzirme süresinin aslında sağdan sansürlü olduğu anlamına gelir. Sağ sansür durumunu ve buna karşılık gelen çözümü detaylandırmadan önce, emzirme süresi değişkenini, çocukların yaşlarına bağlı olarak hala anne sütüyle beslenip beslenmediklerini gösteren duruma göre özetlemek faydalı olacaktır. 0-58 aylık 5.561 çocuktan 2.000'i anne sütü almaya devam etmektedir ki bu da örneklemin %35.90'ına tekabül etmektedir. Bununla birlikte, tamamlanmış ve devam eden emzirmeyi ayırt etmek için çocukların sütten kesildiği zaman bir sınır yaşı (ay olarak) belirlemek gerekir. Sağ sansür problemini kontrol etmeyen herhangi bir analiz, yanlı tahminler verebilir. Dolayısıyla, sağ sansürle başa çıkmak için uygulanabilir bir yaklaşım, hala emzirilen çocuk sayısını en aza indirmek için yeni yürümeye başlayan çocukları düşünerek tamamlanmış emzirmeye odaklanmaktır.

Jayachandran ve Kuziemko (2011) Hindistan için yaptıkları analizlerde, çocuk 36 aylık olduğunda emzirme eyleminin neredeyse tamamlandığını belirtmektedir. Mısır bağlamında Jayachandran ve Kuziemko'nun (2011) çalışmasını tekrarlayan Chakravarty (2015), tamamlanmış emzirmeyi yakalamak için 36. ayın geçerli bir

sınır yaşı olduğunu ima eden aynı argümana dikkat çekiyor. Bu çalışmalar, sırasıyla Hindistan ve Mısır için farklı DHS turlarını kullandıklarından, tamamlanmış emzirmeyi yakalamak için referans yaşını belirlerken doğru ve uygun bir ölçüt oluşturmaktadır. Literatürle uyumlu olarak, TNSA örneği, üç yaşın üzerindeki (yani 36 aylık) çocukların önemli bir bölümünün artık anne sütüyle beslenmediğini doğrulamaktadır. Örneklemde 36 ay ve üzeri çocuk sayısı 1.735'tir (yani 36 aydan küçük çocuk sayısı 3.836 olup, %51.01'i halen anne sütü ile beslenmektedir). Söz konusu 36 aydan büyük çocukların sadece 43tanesi hala anne sütüyle besleniyor – ki bu da örneklemin %2,47'sine tekabül ediyor.

İkinci bağımlı değişken ise TNSA'nın sadece 2008 yılı için ikili bir değişken olarak tanımlanan "Yalnızca Emzirme (EBF) Durumu"dur. TNSA-2008'de annelere "Çocuğunuza ilk kez hangi ayda ek gıda verdiniz?" sorusu yöneltilmiştir. Cevaplar ise ay olarak kaydedilmiştir. Maalesef bu soru TNSA-2013'te yer almamaktadır. TNSA-2008'de çocukların ilk ek gıda alış ayı ortalama 3.04 (SD=3.08) olup, minimum 0 ay maksimum 36 aydır. Ek gıdaya başlama ile ilgili bilgilerle ilgili olarak, EBF Durumu değişkeninin nasıl yapılandırıldığını detaylandırmadan önce ele alınması gereken üç önemli konu vardır. Birincisi, TNSA-2008 örnekleminde beş yaş altı toplam çocuk sayısı 2.849'dur. İkinci olarak, ek gıda alımının ortalama ayı 2.73 çocuk için hesaplanmıştır çünkü henüz herhangi bir katı ve/veya sıvı verilmeyen (sayı 113 olan) çocukları hariç tutuyoruz. Üçüncüsü, ilk ek gıda ayını temsil eden maksimum değer (yani, sadece iki gözlemin olduğu 36. ay) 99. yüzdelik dilimdedir.

Çocuğun ek gıdaya ilk başladığı ayı kullanarak, yaşamın ilk altı ayında sadece anne sütüyle beslenip beslenmediğini belirlemek mümkündür. Bu doğrultuda çocukların EBF statüsü oluşturulurken şu ilke kullanılmaktadır: Çocuğa 6. ayına (6. ay dahil) kadar ek gıda verilmemesi durumunda 1, aksi halde 0 değerini alır. EBF Statü değişkeninin 6-59 aylık çocukları kapsadığını belirtmekte fayda var, çünkü 6 aylıktan küçük çocuklar sola kesilmiş gözlemler oluşturuyor (yani, EBF Statü değişkeninin eşik değeri 6. Aydır ve henüz yaşamının ilk 6 ayını yaşamayan

çocuklar vardır). Bu grup için (6-59 aylık) veriler, çocukların ortalama olarak 3.25. ayda (SD=3.13) sıvı ve/veya katı gıda aldıklarını göstermektedir.

Emzirme Süresi değişkeni için yukarda bahsedilen sağ sansür problemini çözmek için Hayatta Kalma Analizi uygulanmaktadır. Bu analizin temel amacı, sağ sansür problemini, tüm çocukları analize katarak çözmektir. Hayatta Kalma Analizi için gereken tanımlamalar aşağıdaki gibidir. Birincisi, olay (ya da başarısızlık) değişkeni gerekmektedir. Bu bağlamda, 0 ile 58 arasında herhangi bir ayda "sütten kesilme" anlamına gelen olay değişkeni bizim olay değişkenimizdir (yani başarısızlık). İkincisi, zaman değişkeni gerekmektedir. Bu da ay cinsinden yaştır (yani, başlangıç zamanı 0. ay ve bitiş zamanı 58. ay). Olaya kadar geçen süre değişkeni, zaman ve başarısızlığın birleşimi olan emzirme süresidir. Hala emzirilen çocukların varlığı sağ sansürlü verileri temsil etmektedir. Diğer bir deyişle, hala anne sütü ile beslenen çocukların başarısızlığı (sütten kesilme olayını) ne zaman yaşayacağını önceden kestirmek mümkün değildir Bununla birlikte, başarısızlığı daha önce deneyimlemiş olan çocukların, hayatta kalma süreleri kesin olarak bilindiği için herhangi bir sansür gerektirmediğine dikkat edilmelidir.

Hayatta kalma analizinin mantığı artık açık olduğundan, bu tezin sağdan sansürle mücadele etmek için kullandığı yolu tartışmak faydalı olacaktır. TNSA'nın kesitsel doğası göz önüne alındığında, her çocuğu bir kez gözlenmektedir. Sağ sansürlü gözlemleri ampirik araştırmaya dahil etmek için, yaşa bağlı (ay olarak) Vaka Tanımlama Numarasını kullanarak veri setimizin doğasını enine kesitten boylamsal forma dönüştürüyoruz. Bunu yaparak 0. aydan (çocuğun doğumuna tekabül eden) 59'ncu aya kadar veya çocuk 5 yaşından küçükse mevcut yaşına kadar boylamsal (aylık) veri elde etmiş oluyoruz.

Özetle, olaya kadar geçen süre değişkeni (yani boylamsal verilerdeki bağımlı değişken), bir gösterge değişken olan emzirme süresidir. Çocuğun emzirildiğinin bildirildiği tüm aylar için 1, sütten kesildiğinin bildirildiği sonraki tüm aylar için 0 değeri alınır. Boylamsal verilerde çocuklar geriye dönük olarak izlendiği için

kayıt sayısı 79.735 olarak bulunmuştur. Zaman değişkeni ile ilgili olarak, ilk giriş zamanı doğum ayıdır (yani, ay 0) ve son çıkış zamanı ay 58'dir (yani, anneler tarafından bildirilen maksimum emzirme süresi değeri). Ayrıca ortalama çıkış süresi 13.81 ay olarak verilmiştir. Son olarak, başarısızlığı (yani sütten kesme) yaşayan denek sayısı 5.561 çocuktan 3.51'tür.

Yukarıdaki mantığın aynısını kullanarak TNSA-2008 için tanımlanan sadece anne sütüyle beslenme süresi değişkeni için yine 0. aydan (çocuğun doğduğu ayı işaretler) 59. aya kadar boylamsal (aylık) veri üretiyoruz. Daha önce de belirtildiği gibi, TNSA-2008 çocuğun hangi ayda ilk ek gıdayı aldığı hakkında bilgi sağlamaktadır. Bu kapsamda, çocuğun sadece anne sütü ile beslendiği bildirilen tüm aylar için 1 ve çocuğa ilk kez sıvı ve/veya katı besin verildiğinin bildirildiği aydan itibaren 0 değerini alan sadece anne sütü ile beslenen bir EBF gösterge değişkeni oluşturuyoruz. Hayatta Kalma Analizinin zaman değişkeni, beş yaşın altındaki tüm çocukları kapsayan ilk ek gıdayı aldığı aylardır. Başarısızlık (veya olay) değişkeni "ek gıdanın verilmesi"dir. Bu nedenle, bağımlı değişkenimiz - EBF- zaman ve başarısızlığın bir birleşimidir. Özetle TNSA-2008'in (boylamsal) örneklemindeki kayıt sayısı 11.681'dir. Zaman değişkeni için ilk giriş zamanı (yani, çocukların ek gıda ile ilk tanıştırıldığı zaman) 0. ay ve son çıkış zamanı 36. aydır (yani, çocukların ek gıda ile tanıştıkları en son ay). Ortalama çıkış süresi 3.60 aydır.

Ampirik analizlerimizde enlemsel veri için Sıradan En Küçük Kareler (OLS) yöntemi ve Doğrusal Olasılık Model(ler)i (LPM) kullanılmıştır. Hayatta Kalma Analizi'nin yapıldığı ve boylamsal verinin kullanıldığı kısımda ise Cox Regresyon Modellerini kullanılmıştır. Emzirme süresine ilişkin ampirik analizler şu sonuçları ortaya koymaktadır: 1) anket yılları arasında geçen beş yıllık süreçte pozitif bir gelişme; 2) erkek çocuklar lehine cinsiyet ayrımcılığı; 3) normal ve yüksek doğum ağırlıklı çocuklar için bir avantaj, 4) büyük kardeşlere ve ağabeylere sahip olmanın olumlu etkileri. Bununla birlikte sadece anne sütü ile beslenme olasılığını artıran iki önemli faktör vardır: 1) Türkiye'nin kentsel bölgesinde yaşamak; ve 2) ilkokul

diplomasına sahip ve/veya örgün eğitimden yoksun bir anneye sahip olmak (ortaokul diplomasına sahip bir anneye sahip olmakla karşılaştırıldığında).

Ortaya çıkarttığımız sonuçlar politika yapıcılara dört özel konu hakkında önemli mesajlar vermektedir: 1) emzirme süresinde cinsiyet ayrımcılığı; 2) iş-yaşam dengesi uyumsuzluğunu hafifletmek için işyeri desteği (daha iyi eğitimli ve dolayısıyla iş gücü piyasasında olan anneler için); 3) anne sütü ikamelerinin pazarlanmasının düzenlenmesi; ve 4) sadece anne sütü ile beslenme konusunda kırsal/kentsel arasındaki. Bulgularımızın, emzirme uygulamalarının küresel hedeflerine ulaşmak için araştırmacılara, sağlık çalışanlarına ve politika yapıcılara yepyeni politikalar geliştirme konusunda rehberlik edeceğine inanıyoruz.

Bildiğimiz kadarıyla, bu tez Türk annelerinin uzun süreli emzirme yoluyla oğullarının sağlığına daha fazla yatırım yapmayı tercih ettiklerini ortaya koyan ilk çalışmadır. Erkek çocuk önyargılı emzirme, uzun vadede ekonomik sonuçlar üzerinde olumsuz sonuçlar doğurabilir, çünkü şu anda sağlık açısından yetersiz yatırım yapan kız çocukları, geleceğin potansiyel beşerî sermayesinin önemli bir bölümünü oluşturmaktadır. Toplumdaki erkek egemenliğine yönelik kültürel ve/veya dini inançlara bağlılık gibi olası nedenlerin araştırılması, uygun halk sağlığı politikalarının üretilmesi için büyük önem taşımaktadır. Bu kapsamda, bu cinsiyet ayrımcılığının kaynaklarını anlamak için daha fazla araştırmaya ihtiyaç vardır. Bulgularımızın araştırmacıları altta yatan nedenleri araştırmaya yönlendireceğini umuyoruz.

Bulgularımız aynı zamanda daha iyi eğitimli annelerin, çocuklarını daha kısa süreli emzirdiğini ve sadece anne sütü ile beslenme süresini kısalttığını göstermektedir. Bu durum, daha önceki literatürde vurgulandığı gibi, daha yüksek eğitim düzeyinin daha fazla işgücü katılımını teşvik etmesinden ve bunun da iş ve yaşam dengesinin uyumsuzluğuna yol açmasından kaynaklanabilir (Chen ve arkadaşları, 2019). Bu kapsamda, anneler ve çocuklarının ayrı kaldığı zamanlarda emzirme eyleminin nasıl teşvik edilmesi gerektiğini anlamak için daha fazla araştırma yapılmalıdır. Başka bir deyişle, sonuçlarımız, Türk politika yapıcılarının

işyerlerinde emzirme desteğini artırmanın yollarını düşünmeleri gerektiğini vurguluyor. Potansiyel politikalar, süt sağımı için ücretli mola süresi yaratmayı, özel emzirme odaları kurmayı ve ücret kesintisi olmaksızın esnek çalışma saatleri sağlamayı hedefleyen kurumsal emzirme programlarını içerebilir. Eyaletler arasında ciddi farklar olmasına rağmen, Amerika Birleşik Devletleri (ABD), kurumsal emzirme desteği söz konusu olduğunda iyi bir örnek teşkil ediyor. Örneğin, 2002 tarihinde Kaliforniya eyaletinde yürürlüğe koyulan Emzirme Konaklaması yasası, işverenlerin annelerin yeterli mola zamanına ve süt sağımı için özel odalara sahip olmasını sağlamasını zorunlu kılmaktadır. Herhangi bir ihlal gözlemlenirse, işveren 100 ABD Doları ödemekle yükümlüdür (CDC, 2021). Bu noktada belirtmekte fayda vardır ki, Türkiye kapsamında düşünülen potansiyel politikalar sadece kamuda çalışan anneleri değil, analık yardımının daha az sağlandığı özel sektörde çalışan anneleri de dikkate almalıdır.

Bulgularımız "En Zengin" hanelerde emzirme süresinin "En Yoksul" hanelere göre daha kısa olduğunu ortaya koymaktadır. Bu, anne sütü ikameleri olarak gösterilen besinlerin uygun olmayan şekilde pazarlanmasının bir sonucu olabilir. Daha önce de tartışıldığı gibi, yüksek gelirli hanelerde oturan anneler bu ikameleri iki nedenden dolayı satın almayı tercih edebilirler. İlk olarak, bebek maması satın almak için hiçbir mali engelleri yoktur. İkincisi, bu tür besinlerin reklamlarına maruz kalma olasılıkları daha yüksektir (çünkü evlerinde televizyon ve internet bağlantısı olması daha olasıdır), bu da anneleri bu ürünlerin anne sütü yerine uygun ürünler olduğuna inandırır. Bu nedenle, Türk politika yapıcıları, annelerin böyle bir yanılgıya düşmesini önlemek için anne sütü ikamelerinin pazarlanması konusunda aksiyon almalıdır.

Son olarak, kırsal kesimde sadece anne sütü ile beslenme süresinin kentsel bölgelere göre oldukça düşük olduğunu belgeliyoruz. Mevcut literatür, düşük ve orta gelirli ülkelerde kırsal alanda yaşamanın, yaşamın ilk altı ayında sadece anne sütüyle beslenme hususunda dezavantajlı olduğunu gösteren kanıtlar sunmaktadır (Rollins ve diğerleri, 2016; Hitachi ve diğerleri, 2019). Türkiye kapsamında rastladığımız kır/kent farkı çeşitli faktörlerden kaynaklanabilir. Örneğin, daha

önce de belirtildiği gibi Türkiye’nin 61 ilinde Anne ve Bebek Dostu Hastaneler bulunmaktadır. Ancak bu hastanelerin coğrafi dağılımı Türkiye'de eşit olmayabilir. Buna karşılık, kırsal kesimde yaşayan anneler, kentsel kesimdeki annelere göre uygun eğitimi almakta güçlük çekebilir. Bu nedenle, politika yapıcıların Türkiye’nin kırsal kesimindeki kadınları hedef alarak kır/kent farkını en aza indirecek politikalar tasarlamaları gerektiğine inanıyoruz.

C. THESIS PERMISSION FORM / TEZ İZİN FORMU

ENSTİTÜ / INSTITUTE

Fen Bilimleri Enstitüsü / Graduate School of Natural and Applied Sciences ☐

Sosyal Bilimler Enstitüsü / Graduate School of Social Sciences ☒

Uygulamalı Matematik Enstitüsü / Graduate School of Applied Mathematics ☐

Enformatik Enstitüsü / Graduate School of Informatics ☐

Deniz Bilimleri Enstitüsü / Graduate School of Marine Sciences ☐

YAZARIN / AUTHOR

Soyadı / Surname : Oymak
Adı / Name : Cansu
Bölümü / Department : Sosyal Politika / Social Policy

TEZİN ADI / TITLE OF THE THESIS (**İngilizce** / English): DETERMINANTS OF BREASTFEEDING PRACTICES: EMPIRICAL EVIDENCE FROM TURKEY

TEZİN TÜRÜ / DEGREE: **Yüksek Lisans** / Master ☒ **Doktora** / PhD ☐

1. **Tezin tamamı dünya çapında erişime açılacaktır.** / Release the entire work immediately for access worldwide. ☒
2. **Tez iki yıl süreyle erişime kapalı olacaktır.** / Secure the entire work for patent and/or proprietary purposes for a period of **two years. *** ☐
3. **Tez altı ay süreyle erişime kapalı olacaktır.** / Secure the entire work for period of **six months**. ***** ☐

***** Enstitü Yönetim Kurulu kararının basılı kopyası tezle birlikte kütüphaneye teslim edilecektir. /
A copy of the decision of the Institute Administrative Committee will be delivered to the library together with the printed thesis.

Yazarın imzası / Signature .....

Tarih / Date .....
(Kütüphaneye teslim ettiğiniz tarih. Elle doldurulacaktır.)
(Library submission date. Please fill out by hand.)

Tezin son sayfasıdır. / This is the last page of the thesis/dissertation.