American University of Beirut

Prevalence and determinants of exclusive breastfeeding in Jordan: A secondary data analysis of the Jordanian Demographic and Health Survey 2012

by

NAHI EL DIK

A thesis
submitted in partial fulfillment of the requirements
for the degree of Master of Science
to the Department of Epidemiology and Population health of the Faculty of Health Sciences
at the American University of Beirut

Beirut, Lebanon
May, 2014

AMERICAN UNIVERSITY OF BEIRUT

Prevalence and determinants of exclusive breastfeeding in Jordan: A secondary data analysis of the Jordanian Demographic and Health Survey 2012

by
NAHI EL DIK

Approved by:

[Signature] Jocelyn DeJong
Dr Jocelyn DeJong, Professor
Dept. of Epidemiology and Population Health. Advisor

[Signature] Huda Zu
Dr. Huda Zurayk, Professor
Dept. of Epidemiology and Population Health. Member of Committee

[Signature]
DrHayaHamade,Pediatrician. Member of Committee

[Signature] JD for Mohannad Nsour
DrMohannadNsour,Executive director EMPHNET
Amman Jordan. Member of Committee

Date of thesis/dissertation defense: May 7, 2014.

AMERICAN UNIVERSITY OF BEIRUT

THESIS, DISSERTATION, PROJECT RELEASE FORM

Student Name: El DIK NAHI MOUFID
Last First Middle

☑ Master's Thesis ○ Master's Project ○ Doctoral Dissertation

☑ I authorize the American University of Beirut to: (a) reproduce hard or electronic copies of my thesis, dissertation, or project; (b) include such copies in the archives and digital repositories of the University; and (c) make freely available such copies to third parties for research or educational purposes.

☐ I authorize the American University of Beirut, **three years after the date of submitting my thesis, dissertation, or project,** to: (a) reproduce hard or electronic copies of it; (b) include such copies in the archives and digital repositories of the University; and (c) make freely available such copies to third parties for research or educational purposes.

NAHI EL Dik May 19, 2014

Signature Date

This form is signed when submitting the thesis, dissertation, or project to the University Libraries

ACKNOWLEDGMENTS

My recognition and gratitude are addressed to my advisor Dr Jocelyn DeJong for her guidance, valuable assistance, and her patient with me throughout the preparation and writing of this thesis. I could not have come so far and learned so much unless u kept asking for the best.

Special thanks for Dr Huda Zurayk my co-advisor for her precision in work and her support.

AN ABSTRACT OF THE THESIS OF

Nahi El Deek for Master of Science
Major: Population Health

Title: Prevalence and determinants of exclusive breastfeeding in Jordan: A secondary data analysis of the Jordanian Demographic and Health Survey 2012

Exclusive breastfeeding is a major public health issue and has critical importance and benefits for both women's and babies health. Exclusive breastfeeding is promoted by the World Health Organization (WHO) and UNICEF, in addition to being one of the main targets included within the Millennium Development Goals.

This study explored and analyzed the prevalence and determinants of exclusive breastfeeding among a national representative sample of 1009 ever married women 15-49 years of age who had babies aged between 0-6 months using the latest data of the Jordanian Population and Health Survey of 2012.

Secondary data analysis was conducted on the Jordanian data to examine the strength of association between our main outcome of interest which is whether women exclusively breastfed their babies or not by asking them about the food intake in the last 24 hours prior to survey and a number of independent variables. The independent variables included: women's age, area of residence of women, parity, household economic status, women's working status, women's education, age, sex and birth weight of the babies, hospital practices, place and mode of delivery, utilization of antenatal care clinics and smoking (nargileh and/or cigarettes). Univariate analysis of babies between 0-6 months was conducted according to the women's characteristics. Bivariate analysis was used to test the association between each independent variable and our outcome of interest which is exclusive breastfeeding. In the bivariate analysis two by two tables and logistic regression were used. Variables that are found significant at the bivariate level were included in the multivariate level, by taking into consideration not to include two strongly correlated independent variables. In the multivariate analysis logistic regression were used. Unadjusted and adjusted odds ratios as well as p-values, 95% and 90% confidence intervals were calculated and reported.

The results of this study showed that exclusive breastfeeding has been declining over time in Jordan; it declined by 4% from 27% in 2002 to reach 23% in 2012 (figure 2). From the model, the following independent variables were found to be significant predictors of exclusive breastfeeding: the timing of initiation of breastfeeding, whether the women delivered normally or by cesarean section and women's current working status. These indicators can be influenced by policies and interventions. Therefore on the basis of the study findings, recommendation are made to promote early initiation of breastfeeding and skin to skin contact among health practitioners, to promote vaginal delivery and decrease the rate of cesarean section and to encourage policy makers to facilitate breastfeeding among working mothers.

Figures

Figure page

TABLES

Table page

CONTENTS

CHAPTER I

INTRODUCTION

The fifth target of the fourth Millennium Development Goals (MDG 4) is reducing under 5 mortality rate by two thirds between 1990 and 2015 (UNICEF and World Health Organization, 2013). Until 2013 the global under 5 mortality rate has decreased, but looking at the proportion of neonatal mortality rate it has increased. In Jordan according to Demographic and Health Survey of 2012, the under 5 mortality rate declined from 39 deaths per 1000 live births in 1990 to 21 deaths per 1000 live births in 2012 (JPHS, 2012). One way to reduce neonatal deaths and therefore under 5 five mortality is recommended by the World Health Organization and it is related to appropriate feeding practices (WHO, 2002). Breastfeeding is widely known as a cost effective and simple way of nourishing a baby (Oweis et al, 2009). Breastfeeding has many benefits for babies, being important for the development of the brain, nervous system, intellectual improvement, psychometric and social development (Ahuidhail et al, 2013). In addition breastfeeding can boost the immunity system of the child, prevent many infectious diseases like ear infections, for example otitis media (McNeil et al, 2010), gastrointestinal tract infections (Duijts et al, 2010) and many others, and contribute in decreasing child mortality rate. The World Health Organization recommends that newborn babies should be breastfed exclusively. The definition of World Health Organization of exclusive breastfeeding is breastfeeding without any supplementations (water, formula minerals, etc) and it recommends it for 6 months following birth. In Jordan according to Demographic and Health Survey for 2012 the

rate of exclusive breastfeeding has declined from 27% in 2002 to 23% in 2012 (Figure 2).

Many studies focused on the determinants of exclusive breastfeeding as a way to expose the factors that influence the rate of exclusive breastfeeding and draw solutions and recommendations to increase its rate and therefore improve child and maternal health. Determinants of exclusive breastfeeding vary widely and include demographic factors like maternal age, area of residence and parity, socio-economic factors like household economic status, working status, religion, ethnicity, maternal education and father education are also considered as factors that affect exclusive breastfeeding. Some studies referred to characteristics of the babies like age, sex, and birth weight and childbirth related factors like hospital practices, place and mode of delivery as exclusive breastfeeding determinants. Other determinants can be related to the mothers like behavioral factors that includes utilization of antenatal care clinics, smoking and breast problems like lake of breast milk and nipple problems (sores and nipple cracking). Finally, other determinants can be related to knowledge about breastfeeding, community beliefs and intension to exclusively breastfeed before delivery.

A study in Jordan on exclusive breastfeeding by Abuidhail et al in 2013 showed barriers that prevent mothers from exclusively breastfeed. These included thinking that their babies are still hungry after breastfeeding, getting pregnant shortly after delivery and breast problems (Abuidhail et al, 2013). Another study by Oweis et al in 2009 on breastfeeding practices in Jordan showed that 63% of women received information about breastfeeding. Three reasons were given by women in describing what helped her

to make the breastfeeding decision, the first was personal experience, the second was the media and the third was their mothers. As for discontinuing of breastfeeding 38.7% said that the reason was coming back to work (Oweis et al, 2009). A study by Khassawneh et al in 2006 on Jordan showed that women were not satisfied with their maternity leave length and facilities provided at work for breastfeeding.

Due to lack of information on exclusive breastfeeding practices in Jordan and the importance of this subject for women's and babies health data about exclusive breastfeeding is needed. In addition, the low percentage of exclusive breastfeeding (23%) in the last DHS in 2012 (Figure 2) and the increasing percentages of bottle feeding makes it important to search for the reason behind these figures by determining the factors that affect exclusive breastfeeding. This study could inform public health advocates to implement programs that promote exclusive breastfeeding as recommended by the WHO at hospitals and community levels. Since exclusive breastfeeding is a low cost practice that has the possibility of benefitting both women's and babies health, a study on its determinants could help to establish interventions to encourage its widespread adoption. These determinants can be addressed through public health programs.

The thesis is composed of 5 chapters, the first chapter introduced the topic of exclusive breastfeeding among women 15-49 years of age by defining it and mentioning its public health implications and importance for women's and babies health. The second chapter is a review of the literature that presents the benefits of exclusive breastfeeding for women's and babies cited in different articles as well as how exclusive breastfeeding is researched and studied by others researchers. The

literature review present also what is known about breastfeeding and exclusive breastfeeding practices as well as initiatives and interventions to promote exclusive breastfeeding in Jordan. The third chapter is about the methodology of the thesis it contains the source of data, the objective of the thesis and the statistical method used to analyze the data. The fourth chapter presents the results of univariate, bivariate and multivariate analysis. The fifth chapter contains the discussion that presents the findings of the statistical analysis, it presents also points of strength and limitations of the thesis as well as conclusions and recommendations that can be made based on the findings.

CHAPTER II

LITERATURE REVIEW

A) Definition of Exclusive breastfeeding

The World Health Organization (WHO) defines exclusive breastfeeding as breastfeeding without any supplementation. This includes introducing liquids or solid food but it does allow drops of vitamins, mineral supplementation or medicine. The WHO recommends the duration of exclusive breastfeeding to be for 6 months that follow the birth of a child. After 6 months, mixed feeding (breast milk with complementary feeding (formula and food supplementations)) is recommended up to 2 years of age (WHO, 2013).

In 1973 Food and Agricultural Organization (FAO) and WHO did not recommend exclusive breastfeeding beyond 3 to 4 months for the reason of the alleged theory of the lack of energy supplied by only breast milk and required for the baby beyond 3 or 4 months of age (Kramer & Kakuma, 2004). In 2001, a systematic review and expert consultation by Kramer and Kakuma influenced the WHO to change the recommendation to 6 months of exclusive breastfeeding. In this systematic review clinical and observational studies were collected from either developed countries like Finland, Australia and Belarus or from developing countries like Honduras, Iran and Nigeria and a comparison were made between 4 months exclusive breastfeeding and 6 months exclusive breastfeeding (Kramer & Kakuma, 2004). The result of these comparisons showed no evidence that exclusive breastfeeding for beyond 4 months and

up to 6 months can cause weight or length deficiency in babies and in addition their mothers will stay amenorrheic for the duration of breastfeeding (Kramer & Kakuma, 2004). Further evidence showed that exclusive breastfeeding for 6 months can reduce morbidity and mortality in babies compared to 4 months of exclusive breastfeeding (Anderson, Malley & Snell, 2009). Some argued in favor of 4 months exclusive breastfeeding and point out that this evidence of morbidities are not to be considered for developed countries due to the better hygiene in these countries which would reduce the risk of infection associated with complementary food that are provided to the babies along with breast milk. But a comparison study in the United States of America showed that babies exclusively breastfed for ≥ 6 months had a lower risk of respiratory tract infection than babies exclusively breastfed for 4 months (Anderson, Malley & Snell, 2009). Furthermore, a large study in Belarus showed that 6 months of exclusive breastfeeding reduced significantly gastrointestinal infections in babies compared to 4 months of exclusive breastfeeding (Kramer & Kakuma, 2004).

B) Benefits of exclusive breastfeeding and breastfeeding practices

Breastfeeding and especially exclusive breastfeeding confers many benefits on babies and mothers (WHO, 2012).

1) Benefits on babies

The main benefits of breastfeeding are health related issues associated with the properties of breast milk. Breastfeeding provides for babies' prevention from infectious diseases due to the presence of antibodies, enzyme and cytokine in breast milk that help the immune system fight against infection (Hale, 2007). A population-based

prospective cohort study in the Netherlands on 4164 subjects showed that babies exclusively breastfed for 6 months had lower risks of acquiring upper and lower respiratory tract infections and gastrointestinal tract infections compared to never breastfed babies (Duijts, Jaddoe, Hofman & Moll, 2010). Similarly a descriptive study on 400 babies aged less than 6 months in Sakaka city; Saudi Arabia showed less clinical visits, lower risks of respiratory tract infections, bronchiole asthma, less gastroenteritis and skin allergies in babies exclusively breastfed when compared to babies not exclusively breastfed (Abusaad & El-Gilany, 2011). Another cohort study for 9207 babies in Zimbabwe showed that exclusively breastfed babies visited clinics less frequently compared with partially breastfed and mixed breastfed babies especially for diarrhea related cases. This study suggested that most diarrhea cases for partially breastfed and mixed breastfed babies are due to the pathogens found in liquids (other than breast milk) and solid food given to babies (Koyanagi, Humphrey, Moulton, Ntozini, Mutasa, Iliff & Black, 2009).

Breast milk also has other positive characteristics like being a balanced, temperature controlled nourishment, full of nutrients and energy required for babies' growth (Hale, 2007). A review of the studies about risks of formula feeding found that babies having formula feeding in the first 3 to 6 months of life have 2 times the odds of acquiring otitis media than babies exclusively breastfed. In addition babies having formula feeding in early stages of life have a higher risk of having type 1 diabetes mellitus (McNiel, Labbok & Abrahams, 2010). In 2003 Jones and al stated that exclusive breastfeeding for 6 months until 12 months is the most effective measure in reducing and preventing children mortality under 5 years of age (Jones et al, 2003

mentioned in Koyanagi, et al, 2009). In 2008 the Lancet published findings showing that 10% of children mortality under 5 years of age is due to non-exclusivity of breastfeeding for 6 months (Black, et al 2008 mentioned in Koyanagi, et al, 2009).

Skin to skin contact confers physical and mental health benefits on babies. Early skin-to-skin contact between the mother and her baby has been shown to help the baby to adapt to life outside the uterus easily, regulating body temperature, respiration and crying (Bramson, Lee, Moore, Montgomery, Neish, Bahjri & Melcher, 2010). A Cochrane review of Randomized Control Trials comparing Kangaroo mother care versus conventional neonatal care for low birth weight (LBW) babies found that skin-to-skin contact can reduce mortality and is an alternative for conventional medical care for LBW babies, especially in developing countries (Conde-Agudelo, Belizán & Diaz-Rossello, 2011). A cohort study in Western Australia found, after adjusting for covariates, that breastfeeding for a longer period of time has considerable benefits for the development of cognitive IQ, educational attainment and mental health of the child into adolescence (Oddy, Li, Robinson, & Whitehouse, 2012).

2) Benefits on mothers

As for mothers, breastfeeding confers health, psychological, and reproductive benefits. Breastfeeding influences the contraction of the uterus after delivery in order to return its size to the pre-pregnant state; repeat suckling by the baby releases oxytocin that helps in the contraction process (Blincoe, 2005). A trial of over 14000 pre and post-menopausal mothers in the United States showed that mothers who breastfed any of her babies for 4-12 months have an 11% lower risk of acquiring breast cancer than

mothers who have not breastfed at all (Blincoe, 2005). A review of the literature found a decrease in the relative risk by 2% for every month of breastfeeding for developing ovarian cancer (Salone, Vann & Dee, 2013). It has been shown that breastfeeding increases the bone marrow density that helps mothers in minimizing the risk of osteoporosis later on in the menopausal stage (Blincoe, 2005). Other studies showed that breastfeeding helps mothers to lose weight after delivery compared to mothers who do not breastfeed. Other studies indicated that mothers who breastfeed are calmer than the mothers who do not breastfeed this is because of the Prolactin produced with breastfeeding (Hale, 2007). Breastfeeding is a viable way of fertility regulation mothers who breastfeed fully or nearly fully and not amenorrheic (lactation amenorrhea method) have less than 2% chance of becoming pregnant in the 6 months period that follows delivery (Hale, 2007). A Cochrane literature review by Van der Wijden et al in 2003 found that lactation amenorrhea is a possible family planning method (Van der Wijden, Brown, Kleijnen, 2003).

C) Factors associated with Exclusive Breastfeeding

1) Demographic factors

Women's age has been identified in several studies to be a determinant of exclusive breastfeeding. A cross sectional study on exclusive breastfeeding in Al Hassa, Saudi Arabia found that the duration of exclusive breastfeeding is positively correlated with increasing of women's age (Amin, Hablas & AlAbd Al Qader, 2011). Another study on 10205 children in Sweden showed that shorter exclusive breastfeeding is

associated with lower women's age. An age of the women less than or equal to 29 years reduced the likelihood of exclusive breastfeeding (Ludvigsson & Ludvigsson, 2005).

Area of residence of the women has also been shown to be an important determinant of exclusive breastfeeding. For example, in Saudi Arabia, rural residence is positively correlated with exclusive breastfeeding (Amin, Hablas & AlAbd Al Qader, 2011). In Nigeria, on the other hand, the analysis of DHS of 2003 showed that babies in rural areas where less likely to be exclusively breastfed (14.7%) compared to urban areas (20.7%) (Agho, Dibley, Odiase & Ogbonmwan, 2011). In Ethiopia analysis of the DHS of 2005 showed no association between exclusive breastfeeding and place of residence (Alemayehu, Haidar & Habte, 2009). A national survey on breastfeeding and feeding practices in Lebanon showed, by multivariate analysis, that place of residence of the women is an important determinant of exclusive breastfeeding (Batal, Boulghourjian, Abdallah & Afifi, 2005). This study found that women born and residing in rural areas were more likely to exclusively breastfeed for the first 6 months than women born and residing or only residing urban area (Batal, Boulghourjian, Abdallah & Afifi, 2005).

Parity is also a factor that can influence exclusive breastfeeding. For example in Saudi Arabia a cross sectional study showed that multiparity is positively correlated with exclusive breastfeeding (Amin, Hablas & AlAbd Al Qader, 2011). Another cross sectional study in Badan, Nigeria found that parity is associated with exclusive breastfeeding (Lawoyin, Olawuyi & Onadeko, 2001). In Sri Lanka a cohort study showed a higher exclusive breastfeeding rate for the second baby compared to the first born (Perera, Ranathunga, Fernando, Sampath & Samaranayake, 2012). Women in

Jordan have an average of 3.6 children, but fertility differs between governorates (JPFHS, 2007) and has almost stayed the same between 2007 and 2012 with an average of 3.5 children per women (JPFHS), 2012).

2) Socio-economic factors

Household economic status can also be considered as a determinant of exclusive breastfeeding. A cross sectional study in Al Hassa, Saudi Arabia showed that babies belonging to families with higher income were less likely to be exclusively breastfed (Amin, Hablas & AlAbd Al Qader, 2011). Secondary data analysis of DHS 2004 for Bangladesh showed that babies of women from the richest household are less likely to be exclusively breastfed (Mihrshahi, Kabir, Roy, Agho, Senarath & Dibley, 2010). In contrast, secondary data analysis of the DHS 2005 for Ethiopia showed that wealth is a determinant factor of exclusive breastfeeding; women who had a middle and high economic status were two times more likely to exclusively breastfeed than others (Alemayehu, Haidar & Habte, 2009).

As for women's working status, a cross-sectional study in a northern area of Jordan found that women who worked were less likely to exclusively breastfeed (Khassawneh, 2006). A cross sectional study in Saudi Arabia also showed that maternal employment is associated with breastfeeding cessation and therefore shorter exclusive breastfeeding (Amin, Hablas & AlAbd Al Qader, 2011). A cross sectional study from Kenya found that non-employed women are practicing exclusive breastfeeding two times more than employed women (Nyanga, Mustia, Otieno & Kaseje, 2012).

Women's education is also a socio-demographic factor that can be identified as a determinant of exclusive breastfeeding. A study on exclusive breastfeeding in Al Hassa, Saudi Arabia found that higher education of the women is associated with non-exclusivity of breastfeeding compared to less educated women (Amin, Hablas & AlAbd Al Qader, 2011). A cross sectional study on 10205 children in Sweden showed that women who completed elementary school were more likely to exclusively breastfeed their babies less than 4 months as compared to women of higher education (Ludvigsson & Ludvigsson, 2005). A secondary data analysis of DHS 2004 in Bangladesh found that women with primary education were less likely to exclusively breastfeed compared with women with no schooling (Mihrshahi, Kabir, Roy, Agho, Senarath & Dibley, 2010). In contrast a study done in Nigeria found that exclusive breastfeeding was lower among uneducated women compared to those who had primary, secondary or higher education (Agho, Dibley, Odiase & Ogbonmwan, 2011).

3) Characteristics of babies

Like babies age, sex and birth weight were also found to be important determinants of exclusive breastfeeding. Analysis of the DHS 2005 in Ethiopia showed that babies less than 2 months of age were five times more likely to be exclusively breastfed than babies aged between 4 to 6 months (Alemayehu, Haidar & Habte, 2009). A cross sectional study in Egypt showed that being a male baby is a positive predictor of exclusive breastfeeding; boys were 1.8 times more likely to be exclusively breastfed than girls (Al Ghwass & Ahmed, 2011). In Brazil and Honduras lower birth weight was

marginally associated with the early discontinuation of exclusive breastfeeding (Perez-Escamilla, Lutter, Segall, Rivera, Trevino-Siller, Trevino-Siller & Sanghvi, 1995).

4) Childbirth related factors

Hospital practices such as whether they encourage breastfeeding and whether they bring the baby to the mother immediately after birth are also important. In a cross sectional study in Saudi Arabia late initiation of breastfeeding after childbirth is associated with non-exclusivity of breastfeeding (Amin, Hablas & AlAbd Al Qader, 2011). Also in a cross sectional study in Egypt a strong association was found between exclusive breastfeeding and early initiation of breastfeeding (Al Ghwass & Ahmed, 2011). In Canada a study found that in hospital formula supplementation is a predictor of the duration of exclusive breastfeeding (Semenic, Loiselle & Gottlieb, 2008). A national survey on breastfeeding and feeding practices in Lebanon showed that over half of the population studied was not encouraged by the hospital staff to initiate breastfeeding (Batal, Boulghourjian, Abdallah & Afifi, 2005).

Place and mode of delivery are also important factors that influence exclusive breastfeeding. In Nigeria a cross sectional study found that women who delivered in hospitals were 21% more likely to exclusively breastfeed than women who delivered elsewhere (Nyanga, Mustia, Otieno & Kaseje, 2012). In western Tanzania a cross sectional study found that women who delivered in health facilities had three times the odds of practicing exclusive breastfeeding compared to those delivered at home (Nkala & Msuya, 2011). In Nigeria secondary data analysis of DHS 2003 found that exclusive breastfeeding was higher among women being delivered by health professionals

compared to women delivered by traditional birth attendants (Agho, Dibley, Odiase & Ogbonmwan, 2011). A study in Canada showed that cesarean delivery was associated with a shorter duration of exclusive breastfeeding (Semenic, Loiselle & Gottlieb, 2008). Another study by Abusaad and El-Gilanyin, (2011) Sakaka city, Saudi Arabia, showed that cesarean section had negative effects on exclusive breastfeeding (Abusaad & El-Gilany, 2011). In contrast a prospective study in Iran by Saki et al (2010) showed that women who experienced cesarean delivery can successfully exclusively breastfeed their babies (Saki, Eshraghian, Mohammad, Foroushani & Bordbar, 2010).

5) Behavioral factors

Behavioral factors such as women's utilization of antenatal care are also considered important determinants of exclusive breastfeeding. In Egypt a strong association was found between exclusive breastfeeding and antenatal care; women who visited clinics four times or more were 1.9 times more likely to exclusively breastfeed their children than other women who visited clinics less frequently (Al Ghwass & Ahmed, 2011). In the Nigerian DHS of 2003 exclusive breastfeeding was higher among women who attended antenatal care 4 times or more compared to women who visited less than 4 times (Agho, Dibley, Odiase & Ogbonmwan, 2011).

Smoking is a powerful determinant that affects exclusive breastfeeding. A study on 10205 babies in Sweden showed that babies of smoking women were exclusively breastfed for shorter period than non-smoking women (Ludvigsson & Ludvigsson, 2005). Women who smoked 15 cigarettes per day during pregnancy were four times

more likely to stop exclusive breastfeeding than non-smoking women and the duration of exclusive breastfeeding was reduced by 1 month.

D) Prevalence of exclusive breastfeeding

Exclusive breastfeeding rates vary around the globe. WHO/UNICEF recommended the prevalence of exclusive breastfeeding at 6 months to be 90% but neither developing countries nor developed countries reached until now this level.

1) Exclusive breastfeeding in developing countries

In developed countries exclusive breastfeeding tend to be higher among women than in developing countries. A study by Cai et al in 2012 on global trends in exclusive breastfeeding showed that in developing countries (excluding China) the rate of exclusive breastfeeding increase from 33% in 1995 to 38% in 2010. As for Asia (excluding China) the rate of exclusive breastfeeding increased from 38% in 1995 to 41% in 2010. The most advancement on this level is seen in Africa where as rates increased from 22% in 1995 to 35% in 2010, especially in East and Southern African countries where rates increased from 35% to 47% from 1995 to 2012 respectively (Cai, Wardlaw & Brown, 2012).

2) *Exclusive breastfeeding in the Middle East and North African region*

Exclusive breastfeeding differs between countries of the same region where more exclusive breastfeeding is seen where programs and policies are implemented the most. Furthermore differences are seen within the same country where as exclusive

breastfeeding was often higher in rural areas compared to urban areas (Batal, Boulghourjian, Abdallah & Afifi, 2005). According to data provided by the UNICEF in 2012 the Middle East and North Africa region scores among the lowest percentages around the world where in that only 34% of babies under 6 months of age (0-5 months) were exclusively breastfed between the years 2006-2010 (UNICEF, 2012). Looking at countries around Jordan, rates of exclusive breastfeeding differs; it is 20.8% in Turkey according to the Demographic and Health Survey of 2003. Another cross-sectional study of a convenience sample in Turkey (2006) found 50.6% exclusively breastfed babies (Karacam, 2006). In Iran (2006) exclusive breastfeeding for 6 months on a national level was 27.7%; it was higher in rural areas (29%) compared to urban areas (27%) (Olang, Farivar, Heidarzadeh, Strandvik & Yngve, 2009). Studies in Sakaka, Abha and Al Hassa cities in Saudi Arabia found that exclusive breastfeeding at 6 months was only 16.2%, 8.3% and 12.2% respectively (Al-Bilani, 2005), (Abusaad & El-Gilany, 2011) and (Amin et al, 2011). A study in Kuwait on 373 women selected from 4 hospitals found that prevalence of exclusive breastfeeding was 10.5% (Dashti, Scott, Edwards & Al-Sughayer, 2010). In Egypt a study on 1015 women recruited from a rural health unit found the prevalence of exclusive breastfeeding to be 9.7% (Al Ghwass & Ahmed, 2011). In Lebanon a cross sectional study done in 2005 found that exclusive breastfeeding at 1 month was 52.4% and declined to 10.1% at 6 months (Batal, Boulghourjian, Abdallah, & Afifi, R., 2012).

E) Interventions to Promote Breastfeeding

In 1990, UNICEF and the World Health Organization (WHO) launched the Innocenti Declaration that urged the governments around the world to implement 3 interventions that would promote exclusive breastfeeding. The first was to establish what is known as baby friendly hospital initiative that uses the 10 steps to successful breastfeeding of the women who have just delivered. The second point encourages the creation of breastfeeding committees at the national level to maintain monitoring and promoting breastfeeding in the country. The third point was on the legislation level, putting policies for breastfeeding women and to enforce it. In 2002, UNICEF/WHO approved what is called "Global strategy for infant and young child feeding" that put standards to promote optimal breastfeeding and complementary feeding around the globe (UNICEF, 2003). In Europe, the European commission supported a program called Blueprint that encouraged continuous breastfeeding. This program was developed by breastfeeding specialists and women from 29 countries. Blueprint aims to promote breastfeeding in health centers and social institutions, to increase the number of breastfeeding and exclusive breastfeeding women and to increase the time of breastfeeding after 6 months. It aims also to help women with their breastfeeding experience and to improve the skills and quality of the work of health workers who can support women to breastfeed (European commission/WHO, 2002).

F) Initiatives to promote Exclusive Breastfeeding in Jordan

The Jordanian Ministry of Health (MOH) supports the UNICEF/WHO definition of exclusive breastfeeding and recommends breastfeeding for 6 months without water, fluids, or other foods (LINKAGES 2004). In 1997 MOH/LINKAGES lunched a project to integrate the lactational amenorrhea (LAM) method into the national reproductive health system in Jordan. LAM was implemented in 351 maternal and child health governmental centers. One of the criteria of LAM was to promote exclusive breastfeeding. In 1997 and before the implementation of LAM project exclusive breastfeeding according to DHS of Jordan 1997 was 11.9% in 2002 while the project was being implemented exclusive breastfeeding increased and become 26.7% (LINKAGES 2004).

Jordan also adopted the Baby Friendly Hospital Initiative (BFHI) in 1997. In 2007 Queen Rania Al Abdallah declared Dr Jamal Tutounji Hospital a Baby Friendly Hospital. With this declaration the number of Baby Friendly Hospitals in Jordan rose to 6, but only 4% of the country maternity hospitals were certified as Baby Friendly. A study exploring the impact of BFHI on exclusive breastfeeding in 14 developing countries including Jordan, suggested an increase of 7.7% and 5.5% on average in exclusive breastfeeding in the first 2 and 6 months respectively over 5 years period (Abrahams, Labbok, 2009).

G) Breastfeeding practices in Jordan

There have been few relative studies in Jordan addressing exclusive breastfeeding practices. Oweis et al in 2009 found in their cross sectional study among 200 recently delivered women from primary health care centers that 49.5% of women initiated breastfeeding at birth and 60.5% of the women decided to breastfeed before pregnancy. As for breastfeeding duration and frequency the same study found 59.5% of women breastfeed for less than 30 minutes and babies where fed 6-8 times per day by 38.5% of the women. They discovered also that 59% of women tended to introduce supplementation and 55% introduced solid foods for babies less than 6 months (Oweis, Tayem & Froelicher, 2009). Abuidhail et al 2013 in their study among 572 pairs of postpartum women looked at exclusive breastfeeding in 3 major government hospitals and 3 major private hospitals in Jordan. That study found that 52% of their sample did not know what exclusive breastfeeding means and 70% of those who knew, completely or partially, did not want to practice it. Only 1% of women participated in this study were exclusively breastfeeding after 6 months. In addition this study found that inadequate breastfeeding position and practices can lead to breast problems and therefore to discontinuation of breastfeeding (Abuidhail et al, 2013). As for frequency of breastfeeding Abuidhail et al in 2013 found that breastfeeding is practiced 8 times per day on average. As for women who use exclusive breastfeeding as a contraceptive method they breastfeed 4 times per day on average during the night. As for The duration of breastfeeding sessions it was 18 minutes on average among women who knew the meaning of exclusive breastfeeding (Abuidhail et al, 2013).

In another study among a sample of 344 recently delivered women from the northern area of Jordan 58.3% of the women practiced full (exclusive) breastfeeding, 30.3% practiced mixed feeding and 11.4% used infant formula feeding for babies less than 6 months (Khassawneh, Khader, Amarin & Alkafajei, 2006). Another study by Mubaideen and Al Saraireh in 2003 that randomly selected 600 mothers attending antenatal care clinics in Amman, Irbid, and Al Karak found that women wean their babies after 12 months on average and at least 10% of the women breastfed their babies until 2 years of age (Mubaideen & Al Saraireh, 2006). A study on hospital practices among a nationally representative sample of Jordanian hospitals (30 hospitals) showed that 90% of the hospitals responded that their staff routinely helped women to initiate breastfeeding but only 30% of the hospitals responded that their staff bring the baby to the mother for breastfeeding in the first half hour after delivery (Sweidan, Mahfoud & DeJong, 2008).

A secondary data analysis of the Jordanian DHS 2007 done by Srourian in 2013 found that exclusive breastfeeding was significantly associated with women's age, women's working status, women's residing in urban areas, poorer women, having male babies and mode of delivery. The same study did not find any association between exclusive breastfeeding and smoking.

H) Breastfeeding facts and figures in the JPFHS 2012

The Jordanian Population and Family Health Survey in 2012 collected information on many variables and determinants that were included in this study.

Trends in breastfeeding in the DHS data on Jordan from 2002 till 2012 at babies (0-5months) feeding practices showed worsening trends. For instance, the percentage of babies not breastfed increased from 10% in 2002 to 13% in 2012. Exclusive breastfeeding dropped from 27% in 2002 to 22% in 2007 and did not make much change after 5 years; it became 23% in 2012 (JPFHS, 2012). Initiation of breastfeeding is high (99%) among Jordanian women, but only 38% of exclusively breastfed newborns under 2 years are 0-1 month of age and only 9% of exclusively breastfed babies under 2 years are 4-5 months of age. Furthermore 19% of babies begin breastfeeding within 1 hour of delivery and 6.7% within the first day. As for weaning, women tend to terminate breastfeeding after an average time of 12 months (JPFHS, 2012). Regarding marriage age, 15% of women (25-49) marry at age 18 and 33% at age 20. The average age at first marriage is 22 years for women between 25-49 years. High educated women tend to marry at a higher age (5 years difference) compared to primary educated women. As for childbearing the median age of women to have their first born is 24, it has declined by 1 year from 1997 to 2012 (JPFHS, 2012). Concerning area of residence, 83% of ever-married women live in urban areas (JPFHS, 2012). In education, 98% of ever married women attended school and 75% have attended secondary education or higher (JPFHS, 2012). About birth weight, 21% of 1 month old babies had a low birth weight, 20% of 2-3 months old babies and 17% for 4-5 months babies (JPFHS, 2012). Seeing place of delivery, 99% of births took place in health facilities, mostly in the public sector, and very few took place at home (JPFHS, 2012). An increase in cesarean-section was seen between the first and the last DHS, 11% of births were cesarean-section in 1997 while in 2012 it was 28%. Antenatal care in

Jordan is very high, 78% of women have seven or more antenatal care visits and 91% of women have one antenatal care visit before the fourth month of pregnancy (JPFHS, 2012). The Jordan DHS found that 11% of women smoke cigarettes while 10% smoke nargileh and this rate increased from the last DHS of 2007 by 5% (JPFHS, 2012) and (JPFHS 2007).

CHAPTER III

METHODOLOGY

A) Data Sources and Design

This study is based on data from the last Jordanian Population and Family Health survey conducted in 2012 (JPFHS 2012). This is a nationally representative survey of Jordan that collected information on ever-married women between 15-49 years old. This information includes household characteristics, respondents' background characteristics, maternal health, reproductive health, child health and nutrition, women empowerment, domestic violence and husband background. The design of this survey is cross sectional based on the 2004 Jordan Population and Housing census. Jordan is divided into 12 governorates; each governorate is subdivided into districts; each district into sub-districts; each sub-district into localities, and each locality into areas and then sub-areas. Each sub-area was divided into census blocks whish were regrouped and each contained 30 households or more to form a cluster. In total Jordan is composed of 13025 clusters; on average each cluster contains 74 households and 62 households in urban and rural areas respectively. In JPFHS 2012 20 households is taken from each cluster and a new cluster is defined for the refugee camps if 80 percent of the cluster population are from refugees. Populations living in remote areas and collection housing units like hotels, hospitals, work camps, and prisons were excluded from the sampling frame.

Sampling was done in 2 stages; in the first stage 806 cluster were selected with probability proportional to the number of residential household in each cluster. In the second stage, a total number of 20 households per cluster were selected and the total number of households was 16120. The interviewer only interviewed the pre-selected households and no replacement and no changes of these pre-selected households; were permitted. As for the response rates 97% (15190) of households and eligible women 15-49 years (11352 ever-married) were interviewed. In this DHS missing data exist for few variables but they were negligible.

The JPFHS 2012 used 2 questionnaires, the household and the women‘s questionnaire. The household questionnaire, in addition of its usage to discover and collect information about people living in the selected household, was used to identify ever-married women (15-49 years) who were eligible for the women’s questionnaire. Before the survey took place, interviewers were trained in Amman for four weeks on interviewing and fieldwork techniques. To validate the questionnaire and its translation to Arabic it was pretested during a 1week period in 3 urban areas and 1 rural area. The fieldwork started on 9 September and finished on 20 December 2012.

B) Research focus

1) Objectives and hypothesis

Information on exclusive breastfeeding practices in Jordan is needed due to the lack of information on this subject and its importance for women’s and babies health. The objectives of this thesis are therefore to examine the prevalence and identify

the determinants of exclusive breastfeeding in Jordan among a nationally representative sample of Jordanian ever-married women aged 15-49 using DHS data from 2012. The hypothesis for this study is that according to the literature, for the last born babies 0-6 months, whether ever married women exclusively breastfeed or not varies according to a set of women's demographic, socio-economic, behavioral and childbirth related variables as well as babies' characteristics.

2) Dependent and independent variables

The dependent variable of this study is exclusive breastfeeding. All last born babies (0 to 6 months) whose mothers responded that their baby "did not drink from anything from a bottle with a nipple yesterday or last night" (meaning that they fed their babies only breast milk in the 24 hours that preceded the interview) were included in the study as exclusively breastfed babies. The remaining last born babies (0 to 6 months) were considered not exclusively breastfed. The question is, "Did (name) drink anything from the bottle with a nipple yesterday or last night", with possible answers being (1 = yes / 0 = no / 8 = I do not know). Exclusive breastfeeding will be assessed for babies between 0-6 months of age and they are identified in the data by filtering the question "number of months from last birth to interview". The independent variables includes demographic factors such as women's current age (15-24, 25-29, 30-34, 35-49), type of place of residence with (1 = urban / 2 = rural) and parity which is a continuous variable, identified by the question on the number of children ever born. Socioeconomic factors like household economic status with (1 = poorest / 2 = poorer / 3 = middle / 4 = richer / 5 = richest), women's current working status with (0 = no/ 1 =

yes) and women's higher educational level with (0 = no education/ 1 = primary education/ 2 = secondary education/ 3 = higher). Behavioral factors like number of antenatal visits during pregnancy recoded as such (0 = 0 times / 1 = 1 time / 2 = 2-4 times / 3 = >4 times), and smoking status variable that will be a combination between 2 covariates, whether women's smokes cigarettes (0 = no / 1 = yes) and whether women's smokes nargileh (0 = no / 1 = yes), so a mother is a smoker if she smokes cigarettes or nargileh. Childbirth related factors like hospital practices that include if the hospital gave newly delivered women free sample of infant formula upon discharge with possible answers (0 = no / 1 = yes / 8 = I do not know) and time of initiation of breastfeeding that was recoded as such (0=immediately / 1 = within the first hour / 2 = within hours / 3 = within days); place of delivery was recoded as such (0 = home / 1 = public sector / 2 = private sector) and mode of delivery identified by answering the question if the last birth was a cesarean section with (0 = no/ 1 = yes).Characteristics of the last born babies like age of the baby (0-1, 2-3, 4-6), sex of the baby (1 = male / 2 = female) and birth weight (<2.5kg / ≥2.5kg).

C) Statistical analysis

Statistical analysis was performed using the Statistical Package for Social Sciences SPSS version 16. We first conducted descriptive analysis of babies between 0-6 months according to the women characteristics (eg. age, education, working status) and other basic characteristics related to the babies (eg. sex, birth weight, age, place and mode of delivery). Frequencies and percentages were reported for categorical variables,

means and standard deviation were reported for continuous variables. We then used bivariate analysis to test the association between each independent variable from different categories with our outcome of interest which is exclusively breastfed versus not exclusively breastfed. In the bivariate analyses p-values of dependent variable less than 0.2 was considered statistically significant and used in the multivariate analysis. Finally we conducted multivariate analyses where we used logistic regression to examine the association between the main outcome variable, exclusive breastfeeding, and the independent variables that were found to be significant in the bivariate analyses. In the multivariate analyses p-values less than 0.05 were considered statistically significant.

D) Ethical considerations

The Jordanian Population and Family Health survey, conducted by the Jordanian Department of Statistics, is part of the Demographic and Health survey done in many countries around the world. The data collected is completely identified and provided for all people, organizations and universities who wish to conduct studies and analyses about population, family planning and health. The data collected is anonymous and it is confidential. The enrollment in this survey is voluntary and every participant was asked to sign an informed consent form (assuring confidentiality and voluntary participation) in order to be eligible to be interviewed.

CHAPTER IV

RESULTS

A) Univariate Analysis

This study consists of 1009 babies between 0-6 months of age. Using SPSS 16, frequencies and percentages were calculated for the dependent and independent variables that were represented in tables according to characteristics of the babies selected.

1) Basic characteristics of the women

In this paragraph frequencies and percentages in Table 1, 2 and 3 were analyzed. These tables included characteristics of the women that consist of demographic, economic, and behavioral factors. Table 1 shows the demographic characteristics of the respondent women; over a quarter (25.7%) were between 30-34 years of age but the percentage of young ever-married women 15-24 years of age was relatively high at 23.5%. Most of the women reside in urban areas (68.2%) and the mean number of children ever born was 3.24.

Table 2 presents the socio-economic characteristics of the women. More than half of them (53.1%) reached secondary education while only 21 women (2.1%) in total reported having no education at all and 39.4% had a higher educational level. According to the wealth index 25.7% of the women have fall in the poorest quintile and

8% in the richest one. As for working status, apart from the women's own house work, the majority of the women (81.8%) were not working.

Table 3 shows the behavioral characteristics of the women that are relevant to breastfeeding. The majorities (91.2%) were not smokers but among smoking women 5.6% smoke nargileh and 4.8% smokes cigarettes. As for antenatal care visits, very few women (0.6%) did not make antenatal care visits and only 0.8% made one antenatal care visit during pregnancy. The majority of the women (90.3%) visited it their doctor more than 4 times during pregnancy.

2) Basic characteristics of the babies

Tables 4 and 5 show the characteristics of the babies that consisted of health related factors, exclusive breastfeeding, age and sex. Table 4 shows that slightly more than half of the babies (54.4%) are males, almost half of them (43.9%) were between 4-6 months and the majority (89.3%) weighed at birth more than or equal to 2.5kg and only 10.7% were low birth weight babies. As for Exclusive breastfeeding from our total sample of 1009 babies (0-6 months) only 377 (37.4%) were exclusively breastfed. Of these 26.5% are 0-1month of age, 33.4% were 2-3 months, and 40% were 4-6 months. Taking the total age group count 45.7%, 36.3% and 34% of babies 0-1 month, 2-3 months and 4-6 months were exclusively breastfed respectively. Table 5 presents birth related factors and shows that most of the babies (99.4%) were born in public or private sector health facilities and only 4 babies (0.4%) were born at home. Almost half of the women (46.5%) initiated breastfeeding after hours of the delivery and only 12.1% immediately after delivery. Almost three quarters (27.9%) initiated breastfeeding within

days and 8.5% within the first hour. Cesarean section was done in 31% of the deliveries which is a very high percentage 68.1% of the babies were delivered normally. After hospital discharge, in 20.3% of the cases, women were given free sample of infant formula and in 78.3% hospitals did not distribute infant formula.

Table 1: Percent distribution of babies 0-6 months according to the demographic characteristics of the women; JPFHS 2012.

Demographic characteristics	.	Frequency	Percentage
Women's age	15-24	237	23.5
	25-29	314	31.1
	30-34	259	25.7
	35-49	199	19.7
	Total	1009	100
Women's place of residence	Urban	688	68.2
	Rural	321	31.8
	Total	1009	100
Total children ever born (parity)	Mean ± Std deviation		
	3.24 ± 2.017		

Table 2: Percent distribution of babies 0-6 months according to the Socio economic characteristics of the women; JPFHS 2012.

Socio economic characteristics	.	Frequency	Percentage
Women's educational Level	No education	21	2.1
	primary	54	5.4
	secondary	536	53.1
	higher	398	39.4
	Total	1009	100
Wealth index	Poorest	259	25.7
	Poorer	277	27.5

	Middle	220	21.8
	Richer	172	17
	Richest	81	8
	Total	1009	100
Current women's working status	No	825	81.8
	Yes	184	18.2
	Total	1009	100

Table 3: Percent distribution of babies 0-6 months according to behavioral characteristics of their women; JPFHS 2012.

Behavioral characteristics	.	Frequency	Percentage
Smoking status (Nargile and/or cigarettes)	Not smoking	920	91.2
	Smoking	89	8.8
	Total	1009	100
Smokes Nargileh	No	952	94.4
	Yes	57	5.6
	Total	1009	100
Smokes cigarettes	No	961	95.2
	Yes	48	4.8
	Total	1009	100
Number of antenatal visits	No antenatal care visits	6	0.6
	One antenatal care visit	8	0.8
	Two to four antenatal care visits	84	8.3
	More than four antenatal care visits	911	90.3
	Total	1009	100

Table 4: Percent distribution of babies 0-6 months according to their characteristics; JPFHS 2012.

Characteristics of the baby	.	Frequency	Percentage
Sex of the baby	Male	549	54.4
	Female	460	45.6
	Total	1009	100
births 0-6 months distribution	0-1	219	21.7
	2-3	347	34.4
	4-6	443	43.9
	Total	1009	100
weight of the baby	< 2.5kg	108	10.7
	>= 2.5kg	901	89.3
	Total	1009	100
Drank from a bottle with nipple last night	No	377	37.4
	Yes	617	61.1
	Do not know	1	0.1
	Total	995	98.6
	Missing data	14	1.4
Babies exclusively breastfed compared to total number of babies exclusively breastfed by age group	0-1	100	26.5
	2-3	126	33.4
	4-6	151	40
	Total	377	100
Babies exclusively breastfed compared to total number of babies of their age group	0-1 (N=219)	100	45.7
	2-3 (N=347)	126	36.3
	4-6 (N=443)	151	34

Table 5: Percent distribution of babies 0-6 months according to child birth related characteristics; JPFHS 2012.

Child birth related characteristics	.	Frequency	Percentage
Women's place of delivery	Home	4	0.4
	Public or Private sector health facilities	1005	99.6
	Total	1009	100
When child is put to breast (initiation of breastfeeding)	Immediately	122	12.1
	Within the first hour	86	8.5
	Within hours	469	46.5
	Within days	282	27.9
	Total	959	95
	Missing data	50	5
Women's last birth a cesarean section	No	687	68.1
	Yes	312	30.9
	Total	999	99
	Missing data	10	1
Whether the women were given free sample of infant formula after hospital discharge	No	790	78.3
	Yes	205	20.3
	Total	995	98.6
	Missing data	14	1.4

B) Bivariate analysis

In the bivariate analysis every variable was studied to see its significance and the degree of association with the dependent variable exclusive breastfeeding. Table 6 presents the unadjusted odds ratios and their 95% confidence interval as well as p-values of each of our explanatory variables. As for table 7, it presents the overall significance of the multinomial explanatory variable included in the analysis. From the p-values in table 6 and 7, we concluded which one of explanatory variable was a significant predictor of exclusive breastfeeding and included it in the multivariate analysis.

Initiation of breastfeeding was defined by when the child was put to breast after delivery (p-value = 0.000 < 0.05) it was significantly associated with exclusive breastfeeding. Babies who received breast milk by putting him/her immediately to his/hers mother breast after birth (p-value = 0.002 < 0.05) was significantly associated with exclusive breastfeeding. As compared to babies put to the breast within days, babies put immediately had 2.012 times the odds to be exclusively breastfed. Babies who received breast milk by putting him/her to his/hers mother breast within the first hour (p-value = 0.000 < 0.05) was significantly associated with exclusive breastfeeding. As compared to babies put to the breast within days, babies put to the breast within the first hour had 2.531 the odds to be exclusively breastfed. Babies who received breast milk by putting him/her to his/hers mother breast within hours (p-value = 0.000 < 0.05) was significantly associated with exclusive breastfeeding. As compared to babies

immediately put to the breast, babies put to the breast within hours had 1.818 times the odds to be exclusively breastfed.

Mode of delivery, in this case normal or cesarean delivery, was found to be significantly associated with exclusive breastfeeding (p-value = 0.000 < 0.05). The odds of exclusive breastfeeding for women who delivered normally was found to be 1.934 times the odds of exclusive breastfeeding for women who delivered by cesarean section.

Women's working status, apart from her housework, was also found to be a significant predictor of exclusive breastfeeding (p-value = 0.000 < 0.05). The odds of exclusive breastfeeding among not working women was 2.682 the odds of exclusive breastfeeding among women who worked during pregnancy.

Whether the women were given free samples of infant formula after hospital discharge by health facility staff where they delivered, was found not to be associated with exclusive breastfeeding (p-value = 0.495 > 0.05). The odds of exclusive breastfeeding when free infant formula was not given by health facility staff to women after discharge was almost equal (1.119) to the odds of exclusive breastfeeding when free infant formula was given by health facility staff to women after discharge.

The smoking status of the women, in this case nargileh or cigarettes, was also found not to be associated with exclusive breastfeeding (p-value = 0.190 > 0.05). The odds of exclusive breastfeeding among women who do not smoke was 1.366 the odds of exclusive breastfeeding among women who smoke.

The number of antenatal care visits was not associated with exclusive breastfeeding (p-value = 0.065 slightly above the degree of error 0.05). This variable

included 4 categories and only one of them (two to four visits) was significantly associated with exclusive breastfeeding. Women who did not seek antenatal care and women who seek only one time to antenatal care visit during their pregnancy were not associated with exclusive breastfeeding (p-values = 0.873 and 0.438 > 0.05 respectively). As compared to women who went to antenatal care more than 4 times during their pregnancy, women who did not go to antenatal care and women who made only one antenatal care visit had respectively 1.157 and 1.376 the odds to exclusively breastfeed their children. Women who went two to four times to antenatal care was found to be significantly associated with exclusive breastfeeding (p-value = 0.01 < 0.05). As compared with women who went to antenatal care more than four times, women who went two to four times had 1.821 the odds to exclusively breastfeed their babies.

Weight of the babies at delivery was also found not to be associated with exclusive breastfeeding (p-value = 0.764 > 0.05). The odds of exclusive breastfeeding between women who had low and normal birth weight babies was almost the same with odds ratio = 0.938.

Furthermore, Place of residence of the women was not found to be associated with exclusive breastfeeding (p-value = 0.507 > 0.05). Either the women are from urban or rural areas the odds to exclusively breastfeed was the same (odds ratio = 1.098).

In addition, sex of the child was not found to be associated with exclusive breastfeeding (p-value = 0.357 > 0.05). The odds to exclusively breastfeed will not differ between males and females babies with odds ratio = 1.129.

Women's place of delivery was found not to be significantly associated with exclusive breastfeeding (p-value = 0.617 > 0.05). The odds of exclusive breastfeeding among women who delivered in public or private sector health facilities was 0.608 times the odds of exclusive breastfeeding among women who delivered at home.

The wealth index contained 5 categories and the overall predictor (p-value of 0.004 < 0.05) was found to be a significant predictor of exclusive breastfeeding. But only one category from the 5, Richer category, was not associated with exclusive breastfeeding (p-value 0.07 > 0.05). As compared to Richest women, the Richer women had 1.166 times the odds to exclusively breastfeed their babies. Wealth status of Poorest, Poorer and Middle categories were significantly associated with exclusive breastfeeding (p-values = 0.001, 0.001 and 0.036 < 0.05 respectively). As compared to the Richest women, Poorest, Poorer and Middle women had respectively 2.68, 2.57 and 1.88 times the odds to exclusively breastfeed their babies.

Women's current age varies between 15 and 49 years and this predictor contained 4 categories. The overall predictor was found not to be associated with exclusive breastfeeding (p-value = 0.738 > 0.05). As for categories, the age group 15-24, 25-29, 30-34 (p-values= 0.294, 0.580 and 0.795 > 0.05 respectively), neither one was found to be associated with exclusive breastfeeding. As compared to women of age group 35-39, women of age group 15-24, 25-29 and 30-34 had respectively 1.231, 1.109 and 1.052 times the odds to exclusively breastfeed their babies.

Total Number of children (parity) was found to be marginally associated with exclusive breastfeeding (p-value = 0.049 < 0.05). The odds of exclusive breastfeeding

among women who had 1 to 3 children were 0.769 times the odds of exclusive breastfeeding among women who had 4 or more children.

Level of education had 4 categories, the overall predictor was found to be significantly associated with exclusive breastfeeding (p-value = 0.001 < 0.05). Looking at its different categories, women with no education (p-value = 0.043 < 0.05) was found to be a predictor of exclusive breastfeeding and significantly associated with it. As compared to women with higher education, women with no education had 2.481 times the odds to exclusively breastfeed their babies. Women with primary education (p-value = 0.566 > 0.05) was found not to be associated with exclusive breastfeeding. As compared with women with higher education, women with primary education had 1.196 times the odds to exclusively breastfeed their babies. Women with secondary education (p-value = 0.000 < 0.05) was found to be significantly associated with exclusive breastfeeding. As compared with women of higher education, women of secondary education had 1.7 times the odd to exclusively breastfeed their babies.

The bivariate analysis showed that the final predictors that were significantly associated with exclusive breastfeeding and the ones not significantly associated but were included were 8, including time of initiation of breastfeeding (when child was put to breast), mode of delivery, women's smoking status, women's working status, number of antenatal care visits, women's wealth status, parity and women's educational level.

Table 6: Unadjusted Odds Ratio with 95% confidence interval and p-values of different variables or predictors of Exclusive breastfeeding.

Variables	Unadjusted Odds Ratio	P-value	95% Confidence interval
When child was put to breast (initiation of breastfeeding)			
Within days	1	…	
Within hours	1.818	**0.000**	1.291-3.125
Within the first hour	2.531	**0.000**	1.562-4.166
Immediately	2.012	**0.002**	1.291-3.125
Women's last birth a cesarean section			
No	1.934	**0.000**	1.443-2.597
Yes	1	…	
Current women's working status			
No	2.688	**0.000**	1.831-3.952
Yes	1	…	
Whether the women were given free sample of infant formula after hospital discharge			
No	1.119	0.495	0.811-1.545
Yes	1	…	
Women's Smoking status (Nargileh or/and cigarettes)			
No	1.366	0.190#	0.856-2.178
Yes	1	…	
Number of antenatal visits			
more than four visits	1	…	
Two to four visits	1.821	**0.01**	1.157-2.785
One visit	1.376	0.438	0.431-6.993

No visit	1.157	0.873	0.192-6.944
Weight of the baby at birth			
<2.5kg	0.938	0.764	0.615-1.430
>=2.5kg	1	…	
Women's place of residence			
Urban	1.098	0.507	0.833-1.449
Rural	1	…	
Sex of the child			
Male	1.129	0.357	0.872-1.461
Female	1	…	
Women's place of delivery			
home	1		
Private or Public sector health facilities	0.608	0.617	0.0853-4.347
Wealth index			
Richest	1	…	
Richer	1.166	0.070	0.955-3.267
Middle	1.88	**0.036**	1.041-3.412
Poorer	2.57	**0.001**	1.445-4.566
Poorest	2.68	**0.001**	1.501-4.784
Women's current age			
35-49	1	…	
30-34	1.052	0.795	0.715-1.540
25-29	1.109	0.580	0.766-1.607
15-24	1.231	0.294	0.834-1.821
Total children ever born (parity)			
> 4	1	…	
1-3	0.769	**0.049**	0.591-0.999
Women's educational Level			

higher	1	…	
secondary	1.700	**0.000**	1.29-2.237
primary	1.196	0.566	0.645-2.202
no education	2.481	**0.043**	1.027-6.007

Table 7: P-values of the overall multinomial variables.

Variables	Overall significance (p-value) of the variable
Wealth index	**0.002**
Women's current age	0.738
Educational level	**0.001**
When child was put to breast	**0.000**
Number of antenatal care visits	0.065[#]

#: variables included in the multivariate analysis that had an association of p-value < 0.2 but p-value > 0.5

C) Multivariate analysis

In the multivariate analysis all independent variables that were significant (p-value < 0.05) in the bivariate analysis and all independent variables either binomials or multinomials (overall p-value) that had an association of p-value < 0.2 were included in the final model. This included number of antenatal care visits and women's smoking status.

After running the full model with 95% confidence interval ($\alpha = 0.05$) adjusted odds ratios and p-values were obtained. Table 8 presents both the unadjusted and adjusted odds ratios for comparison purposes, p-values of the multivariate analysis and 95% confidence intervals for the odds ratios were also shown. Table 9 presents p-values of the multinomial variables of the multivariate analysis.

In the multivariate model at $\alpha = 0.05$, only time of breastfeeding initiation and women's working status continued to be predictors of exclusive breastfeeding. Time of breastfeeding initiation (overall p-value = 0.026 < 0.05) and all of its categories, within hours, within the first hour and immediately (p- values 0.012, 0.007, 0.049 < 0.05 respectively) were found to be significantly associated with exclusive breastfeeding. As for differences between unadjusted and adjusted odds ratios no big differences were found. Adjusting for other covariates, women who had initiated breastfeeding immediately, within the first hour and within hours had respectively 1.6, 2.15 and 1.6 times the odds to exclusively breastfeed their babies as compared to those who had initiated breastfeeding within days.

Current working status of women was found to be highly associated with exclusive breastfeeding (p-value = 0.001 < 0.05). A comparison between adjusted and unadjusted odds ratios revealed no big changes. Adjusting for other covariates, women who were not working currently had 2.07 times the odds to exclusively breastfeed their babies as compared to women who were currently working.

At $\alpha = 0.1$ whether the women had had cesarean section was found to be significantly associated with exclusive breastfeeding (p-value = 0.079 < 0.1). As for odds ratios, before adjustment it was 1.9 and after adjustment it became approximately 1.4. Adjusting for other covariates, women who delivered normally had 1.4 times the odds to exclusively breastfeed their babies as compared to women who experienced cesarean section. Other predictors were found to be marginally associated with exclusive breastfeeding like the two categories of the wealth status of the women "poorer" and "poorest" (p-values = 0.106 and 0.103 respectively). The comparison between unadjusted and adjusted odds ratios of the two categories revealed a drastic change in figures. Unadjusted odds ratios were 2.57 and 2.68 and became 1.665 and 1.703 respectively. Adjusting for other covariates, women with poorer and poorest wealth status had respectively 1.665 and 1.703 times the odds to exclusively breastfeed their babies as compared to women with the richest wealth status.

The multivariate analysis showed that the final determinants of exclusive breastfeeding at $\alpha = 0.05$ were time of initiation of breastfeeding (when child was put to breast), and current women working status; at $\alpha = 0.1$ mode of delivery was added to the determinants.

Table 8: Unadjusted and adjusted Odds Ratios with 95% confidence interval and P-values of different predictors of exclusive breastfeeding.

Variables	Unadjusted Odds Ratios	Adjusted Odds Ratios	P-values	95% Confidence intervals
When child was put to breast (initiation of breastfeeding)				
Within days	1	1	…	
Within hours	1.818	1.573	**0.012**	1.103-2.245
Within the first hour	2.531	2.154	**0.007**	1.239-3.746
Immediately	2.012	1.631	**0.049**	1.002-2.656
Last birth a cesarean section				
No	1.934	1.361	0.079*	0.965-1.918
Yes	1	1	…	
Current women working status				
No	2.688	2.07	**0.001**	1.329-3.224
Yes	1	1	…	
Women's smoking status (Nargileh or/and cigarettes)				
No	1.366	1.238	0.405	0.749-2.048
Yes	1	1	…	
Number of antenatal visits				
more than four visits	1	1	…	
Two to four visits	1.821	1.389	0.189	0.850-2.269
One visit	1.376	1.92	0.384	0.443-8.330
No visit	1.157	1.06	0.951	0.167-6.732
Wealth index				
Richest	1	1	…	
Richer	1.166	1.384	0.324	0.725-2.639

Middle	1.88	1.466	0.232	0.783-2.748
Poorer	2.57	1.665	0.106	0.897-3.093
Poorest	2.68	1.703	0.103	0.898-3.230
Total children ever born (parity)				
> 4	1	1		
1-3	0.769	0.835	0.212	0.629-1.108
Women's educational Level				
higher	1	1	…	
secondary	1.7	1.18	0.327	0.847-1.644
primary	1.196	0.798	0.529	0.395-1.612
no education	2.481	1.539	0.368	0.602-3.933

*: variable that was significant at 90% confidence interval ($\alpha = 0.1$)

Table 9: P-values of the overall multinomial variables in multivariable settings.

Variables	Overall significance of the model
Wealth index	0.51
Educational level	0.44
When child was put to breast	**0.026**
Number of antenatal care visits	0.494

CHAPTER VI

DISCUSSION

The main objective of this study is to identify determinants that encourage women 15 to 49 years of age to exclusively breastfeed their babies. Many factors were considered; demographic factors, socio-economic factors, characteristics of the babies, child birth related factors and behavioral factors.

A) Study findings

One of the key findings of this study is when women started to breastfeed after birth, it is an important determinant of exclusive breastfeeding. The earlier the mother put her child to her breast, more likely that this mother adopts exclusive breastfeeding. It was found that if newborn babies were put to the breast within the first hour they were two times more likely to be exclusively breastfed as compared to newborn babies put within days. Similar results were found in Saudi Arabia where a study by Amin et al (2011) in Al Hassa city found that late initiation of breastfeeding after birth can reduce the odds of exclusive breastfeeding. Another cross sectional study in Egypt done by Al Ghwas et al (2011) found that early initiation can positively affect exclusive breastfeeding. The World Health Organization defines initiation of breastfeeding in the first hour as poor when the percentage of mothers who initiated breastfeeding is 0 - 29%, fair 30 – 49%, good 50 – 89% and very good 90 – 100 % (Örün, Yalçın,

Madendag & Üstünyurt-Eras, 2010). In our study only 20.6% of the women initiated breastfeeding within the first hour which classifies it as poor. In public hospitals 26% of women initiated breastfeeding within the first hour and only 8% in private hospitals (Table 10). In Turkey the percentage was 32.8% (Örün, Yalçın, Madendag & Üstünyurt-Eras, 2010), 11.4% in Saudi Arabia (El-Gilany, Shady & Helal, 2011 as mentioned in Al Juaid, Binns & Giglia, 2014), and 39% in Kuwait (Amin, Hablas & AlAbd Al Qader, 2011). So in other terms Jordan performs poorly in terms of early initiation of breastfeeding but compared to other countries of the region it performs better than Saudi Arabia but worse that Kuwait and Turkey. Continuation of exclusive breastfeeding was found to be poor as the babies' age increase, by the time the babies get to 4-6 months the percentage of exclusive breastfeeding was less than it started. According to the findings of this study 45.7% of the 0-1 month age group babies were exclusively breastfed compared to 34% of the 4-6 months age group babies.

The other key finding was current women's working status; our study found that women who were not currently working had two times more likely to exclusively breastfeed their babies than women who were currently working. Similar findings were found in other studies; Khassawneh et al (2006) in a study in north of Jordan found that women who worked are less likely to exclusively breastfeed. Another study by Amin et al (2011) in Saudi Arabia found that women's working status is associated with shorter exclusive breastfeeding. Many reasons can be mentioned for discontinuation of exclusive breastfeeding for women who work. These reasons indicate that the work environment and work places that are not equipped with breastfeeding facilities, do not allow women who resumed work to breastfeed freely and properly so women are forced

to bottle feed and start supplementation. Women lack of knowledge about pumping and storing breast milk might lead to early weaning especially by working women. In addition, short maternity leave where women are forced to come back to work after a relatively short period after delivery might discourage continuation of breastfeeding. In the Jordanian law working women are eligible for 70 days for maternity leave in private and public sector and 90 days for female civil servants (Majcher-Teleon & Ben Slimène, 2009); this is a short period if the woman tended to exclusively breastfeed for 6 months. A study by Cohen and Mrtek showed that if a work place is breastfeeding friendly, working women were more likely to breastfeed for at least 6 months (Cohen & Mrtek, 1994 as mentioned in Khassawneh et al, 2006).

The multivariate analysis at $\alpha = 0.1$ showed another predictor, delivery by cesarean section, that was significantly associated with exclusive breastfeeding. Women who delivered normally were one and a half times more likely to exclusively breastfeed their babies compared to women who delivered by cesarean section. These findings are comparable to other studies that reached the same conclusion. A study by Abusaad and El-Gilanyin, (2011) Sakaka city, Saudi Arabia, showed that cesarean section had negative effects on exclusive breastfeeding. But, in a prospective study in Iran by Saki et al (2010) showed that women who experienced cesarean delivery can successfully exclusively breastfeed their babies. This study suggested that factors like skin to skin contact between the mother and her baby and support from professional and family after cesarean section can lead to continuation of exclusive breastfeeding (Saki, Eshraghian, Mohammad, Foroushani & Bordbar, 2010). Other studies found a negative relation between cesarean section and initiation of breastfeeding and therefore

exclusive breastfeeding. A study by Hazir et al, using data from the Demographic and Health Survey of Pakistan (2006-2007), found that women who delivered by cesarean section had higher odds of not initiating breastfeeding in time (Hazir, Akram, Nisar & Kazmi, et al 2012). Another study by Amin et al (2011) in Al Hassa, Saudi Arabia showed that cesarean section was a negative predictor of initiation of breastfeeding.

In Jordan according to different DHS from 2002 till 2012 the national rates of cesarean section increased from 16% in 2007 to 19% in 2007 and 28% in 2012 (Figure 1). In our study higher percentages of cesarean section was seen in private sector hospitals (36%) compared to public sector that scores high also in cesarean section (30%) (Table 11). There is no consensus about optimal cesarean section rates, but the World Health Organization recommends a range of cesarean section rates between 5 – 15%. The reason behind low rates of exclusive breastfeeding among women who delivered by cesarean section might be due to the complication that arise after the surgery. Women might experience pain, fatigue, prolonged recovery, and difficulties in positioning herself comfortably for breastfeeding. Anesthesia during the surgery can interfere with breastfeeding behaviors of the babies (depress sucking behavior) and therefore will influence negatively breastfeeding (Kuguoglu, Yildiz, Tanir & Demirbag, 2012).

Another marginally significant predictors at $\alpha = 0.1$ in the multivariate analysis were the two categories “Poorer” and “Poorest” in the variable women wealth status. Women from these two categories consisted around half of our studied sample. Our study found that being in the “Poorer” and “Poorest” categories was positively correlated with exclusive breastfeeding and women exclusively breastfeed nearly one

and half times more likely than richest women. Similar results were found in a cross sectional study in Al Hassa, Saudi Arabia showed that babies belonging to families with higher income were less likely to be exclusively breastfed (Amin, Hablas & AlAbd Al Qader, 2011). Secondary data analysis of DHS 2004 for Bangladesh showed that babies from the richest household are less likely to be exclusively breastfed (Mihrshahi, Kabir, Roy, Agho, Senarath & Dibley, 2010). A secondary data analysis of DHS in Pakistan 2006-2007 done by Hazir et al (2012) showed that babies' belonged to richest families were more likely to be bottle-fed. Women from higher economic status might tend to look after their appearances. Breastfeeding might damage the looks of their breasts, so a lower initiation and not prolonged breastfeeding duration might be common. Higher odds of exclusive breastfeeding were seen in the poorer and poorest women this might be due to the high cost of infant formula and families not being able to afford it. So women tend to breastfeed for a longer period of time as breastfeeding is a way to feed their babies for free.

An important predictor that was significantly associated with exclusive breastfeeding in the bivariate level but showed no significance at the multivariate level is the level of the women's education. Non educated women had two and a half times the tendency to exclusively breastfeed their babies compared to higher educated ones. This means that higher education might not mean higher awareness of the values of exclusive breastfeeding. Higher educated women might be involved more in the work force and this might not allow her to breastfeed properly.

Smoking status was not found to be a significant predictor in the multivariate analysis. This finding is similar to another study by Srourian (2013) on the DHS 2007

that did not find any significant association between exclusive breastfeeding and smoking status.

Place of delivery was not found to be a predictor of exclusive breastfeeding but the odds ratio of this relation is not equal to one. A woman who delivered at home was more likely to exclusively breastfeed by one and a half times than a woman who delivered in a hospital. This unusual result is probably due to the very low number of cases (4) of women who delivered at home of whom only two of them exclusively breastfed their babies.

No preference for exclusive breastfeeding is found between male and female babies; both are equally likely to be exclusively breastfed. This is a significant result showing no gender preference in the context of breastfeeding. The opposite result was found in Srourian thesis (2013) based on the 2007 DHS data where having a male child is significantly associated with exclusive breastfeeding. So a five years period between the two DHS's (2007 till 2012) probably might have made this change of decreasing a gender bias towards male babies.

Parity was also not found to be significantly associated with exclusive breastfeeding. But, number of children per family (parity) showed that women that had big families tended to exclusively breastfeed more. This might be due to the poor economic status of families that resort to breastfeeding as a cost effective method.

Number of antennal care visits was a surprising finding. In our study 90% of women had more than four antenatal care visits so not being significantly associated with exclusive breastfeeding might reflect the quality of antenatal care. This includes

the type of information given by doctors to pregnant women during their visit and if they encourage them to breastfeed or exclusively breastfeed.

At the bivariate level place of residence was not associated with exclusive breastfeeding which indicates a high awareness of the importance of exclusive breastfeeding in the urban areas. Almost 70% of our sample resides in urban areas.

Giving women free formula samples by the hospital staff, total children ever born, mother's current age and weight of the baby at birth were not found to be associated with exclusive breastfeeding at the bivariate level.

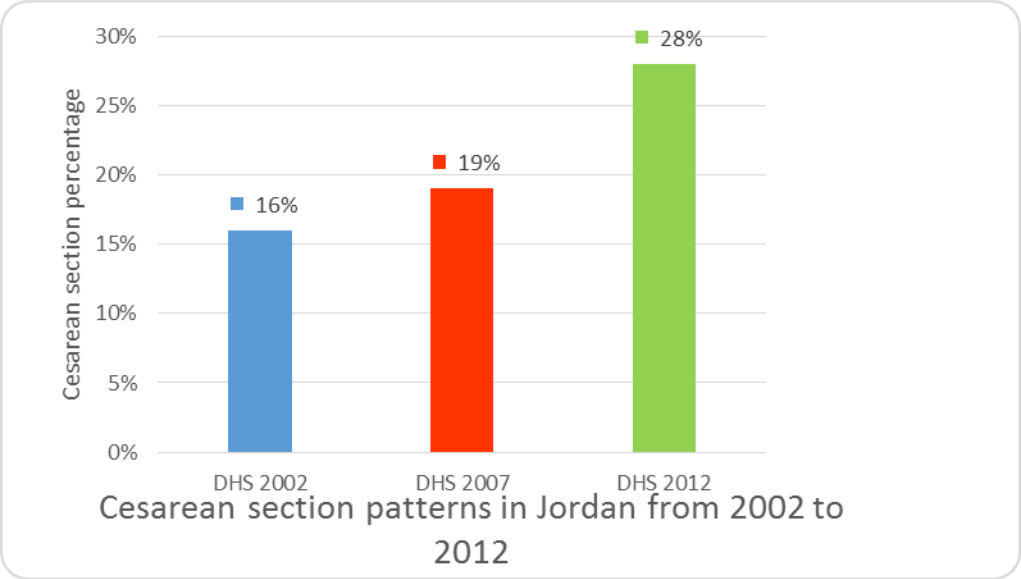

Figure 1

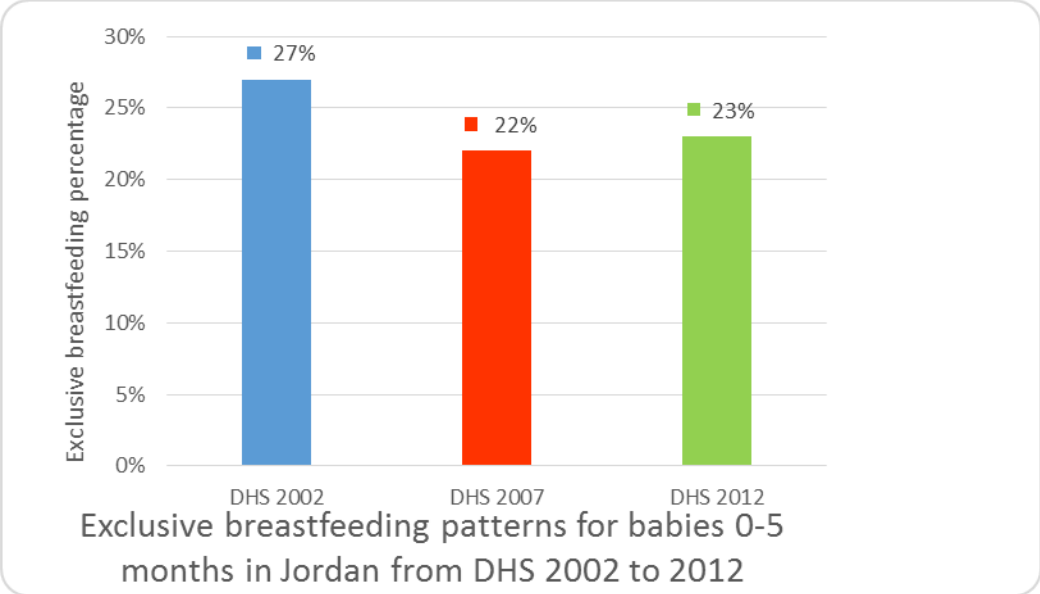

Figure 2

Table 10: Percentage of women initiated breastfeeding within the first hour in private and public hospitals.

		Place of delivery			
		Home	Public	Private	Total
Initiation of breastfeeding	Immediately	1	109	12	122
	Within the first hour	2	78	6	86
	Within hours	1	346	122	469
	Within days	0	195	87	282
Total		4	728	227	959
Percentage of women initiated breastfeeding within the first hour			26%	8%	

Table 11: Percentage of cesarean sections in private and public hospitals.

		Place of delivery			
		Home	Public	Private	Total
Cesarean	No	4	539	144	687
	Yes	0	231	81	312
Total		4	770	225	999
Percentage of women's delivered by cesarean section		0	30%	36%	31%

B) Strengths and limitations

1) Limitations

This study is based on the Demographic and Health Survey data which is cross sectional in nature, so causality could not be established. There is possibility of recall bias, is that women might have had difficulties in remembering about previous day feeding information for their babies when asked. The definition of the independent variable, exclusive breastfeeding, was based on a question about food intake in the past 24 hours of the survey. Although the World Health Organization recommends this method, the variability in babies' food in other days was not captured and overestimation of exclusive breastfeeding might have happened. Social desirability might help also increasing the percentage of exclusive breastfeeding. Correlation between independent variables was not accounted for in the multivariate analysis.

2) Strengths

The main strength of this study is the nationally representative sample of the Demographic and Health Survey and the ability to generalize its findings to the entire country. The comprehensive nature of the data found in the Demographic and Health Survey about mother's demographics, socio-economic status and child birth related factors in addition of the high response rate (97%) of pre-selected ever married women during the time of data collection. The data collection was done by a pre-tested questionnaire and interviewers were well trained on how to administer it. Missing data in our variables were negligible and in some variables they were zero. The advantage of

the Demographic and Health Survey is the ability to do a comparison of results with previous such surveys or future ones.

C) Conclusion and recommendations

The findings of this study suggested that the main barrier that explained the rate of exclusive breastfeeding lies in time of initiation of breastfeeding. Whether the child is put immediately or within hours after delivery to their mothers' breast was more likely to be exclusively breastfed. Women's working status was also found to affect exclusive breastfeeding behavior. Working women confront in many cases serious difficulties in continuing breastfeeding after going back to work. Delivery by cesarean section also influences exclusive breastfeeding behavior. Women who experienced cesarean section delivery might have confronted many health problems after surgery that prohibited them from initiating properly breastfeeding and later on to exclusively breastfeed.

Exclusive breastfeeding rate in Jordan was 27% in 2002 in 10 years interval and precisely in 2012 it declined by 4% and became 23% (Figure 2). Jordan is further away from reaching the Millennium Development Goals and World Health Organization recommendation of a 90% exclusive breastfeeding rate. The nature of the findings that this study revealed were amenable to change and can be targeted and work on for the sake of improving exclusive breastfeeding prevalence. Some recommendations for this matter are for improving the times of initiation of breastfeeding. Bringing the baby to the mother immediately or within one hour of birth

is recommended. Staff and doctors of health facilities that are related to the delivery and post-delivery process must be encouraged to help women to breastfeed soon after delivery and be aware about the benefits of early initiation of breastfeeding. Special policies and programs that promote early initiation of breastfeeding and skin to skin contact are to be issued and implemented in hospitals and health facilities. Asking hospitals to adopt the baby friendly initiative that encourages women to exclusively breastfeed and to depend less on formula feeding in the first 6 months of life is recommended. Working women, and the work place, can be a barrier to breastfeeding; women must feel comfortable in breastfeeding even at work. Policies must focus on changing the work place into becoming a breastfeeding friendly environment. Other recommendations involve the length of maternity leave; the Jordanian government allows for 70 days only which might not be sufficient for women to establish a breastfeeding pattern with her new born baby. Increasing the length of maternity leave by the government is recommended. In some countries paternity leave is implemented, this might help women in their childbearing process and therefore breastfeeding so a consideration of a paternity leave is advised.

Decreasing the cesarean section rates can also help increase rates of exclusive breastfeeding. Awareness programs must target doctors as well as women on the risks of cesarean section on exclusive breastfeeding and breastfeeding in general. Policies in hospitals especially in private ones should be clear on carrying a vaginal delivery as a standard delivery and the use of cesarean section as an alternative resort procedure. At times when a cesarean section is inevitable, a clear process of support for breastfeeding must be implemented by doctors and health staff as well as the family. Families must

be informed about the way to support and encourage newly delivered women for breastfeeding. Advocacy campaigns about the benefits of breastfeeding especially exclusive breastfeeding must target women in childbearing age as knowledge is a changeable aspect. Especially educated women those of upper socio economic status who might need tailored messages to encourage exclusive breastfeeding.

REFERENCES

Abuidhail, J., et al., Exclusive breastfeeding in Jordan: Prevalence, duration, practices, and barriers. *Midwifery* (2013), http://dx.doi.org/10.1016/j.midw.2013.01.005

Abrahams, S. W., Labbok, M. H. (2009). Exploring the impact of Baby Friendly Hospital Initiative on trends in exclusive breastfeeding. *International Breastfeeding Journal*, *4*(11), doi: 10.1186/1746-4358-4-11

Abusaad, F. E., & El-Gilany, A. (2011). Exclusive breastfeeding and infant morbidity in Sakaka city, Saudi Arabia. *Middle East Journal of Nursing, 5*(6), 3-8.

Agho, K., Dibley, M., Odiase, J., & Ogbonmwan, S. (2011). Determinants of exclusive breastfeeding in Nigeria. *BioMed central Pregnancy & Childbirth*, 11(2),

Alemayehu, T., Haidar, J., & Habte, D. (2009). Determinants of exclusive breastfeeding practices in Ethiopia. *Ethiop.J.Health* Dev, 23(1), 12-18.

Al-Bilani, A. M. (2012). Breastfeeding knowledge, attitude and practice among school teachers in Abha female educational district, southwestern Saudi Arabia. *International Breastfeeding Journal*, *7*(10), 1-6.

Al Ghwass, M. M. E., & Ahmed, D. (2011). Prevalence and predictors of 6-month exclusive breastfeeding in a rural in Egypt. *Breastfeeding Medicine*, 6(4), 2011.

Al Juaid, D., Binns, C., & Giglia, R. (2014). Breastfeeding in Saudi Arabia: a . *International Breastfeeding Journal*, *9*(1), doi: 10.1186/1746-4358-9-1

Amin, T., Hablas, H., & AlAbd Al Qader, A. (2011). Determinants of initiation and exclusivity of breastfeeding in Al Hassa, Saudi Arabia. *Breastfeeding Medicine*, 6(2), 59-68.

Anderson, J., Malley, K., & Snell, R. (2009). Is 6 months still the best for exclusive breastfeeding and introduction of solids? a literature review with consideration to the risk of the development of allergies. *Breastfeeding review*, *17*(2), 23-31.

Batal, M., Boulghourjian, C., Abdallah, A., & Afifi, R. (2005). Breastfeeding and feeding practices of infants in a developing country: a national survey in Lebanon. *Public Health Nutrition*, 9(3), 313-319.

Black RE, Allen LH, Bhutta ZA, et al. Maternal and child under nutrition: global and regional exposures and health consequences. *Lancet* 2008; 371:243–60.

Blincoe, A. (2005). The health benefits of breastfeeding for women. *British Journal of Midwifery, 13*(6), 398-401.

Bramson, L., Lee, J. W., Moore, E., Montgomery, S., Neish, C., Bahjri, K., & Melcher, C. L. (2010). Effect of early skin-to-skin mother–infant contact during the first 3 hours following birth on exclusive breastfeeding during the maternity hospital stay. *Journal of Human Lactation*, *26*(2), 130-137

Cai, X., Wardlaw, T., & Brown, D. W. (2012). Global trends in exclusive breastfeeding. *International Breastfeeding Journal*, *7*(12), doi: 10.1186/1746-4358-7-12.

Conde-Agudelo, A., Belizán, J., & Diaz-Rossello, J. (2011). Kangaroo mother care to reduce morbidity and mortality in low birth weight infants (review). *The Cochrane library*, issue 3, 1-116

Dashti, M., Scott, J. A., Edwards, C. A., & Al-Sughayer, M. (2010). Determinants of breastfeeding initiation among women in Kuwait. *International Breastfeeding Journal*, *5*(7), doi: 10.1186/1746-4358-5-7

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

European Commission Directorate Public Health and Public Assessment and the Unit for Health Services Research and International Health WHO Collaborating Centre for Maternal and Child Health. *The Blueprint for Action on Breastfeeding in Europe*, retrieved from http://europa.eu.int/comm/health/ph_projects/2002/promotion/promotion_2002_18_en.htm

Fathi, N. Department of Statistics [Jordan] and Macro International Inc, Calverton, Maryland, USA: Department of Statistics and Macro International Inc. (2013). *Jordan population and health survey 2012*. Retrieved from MEASURE Demographic and Health Survey website: http://www.measuredhs.com/what-we-do/survey/survey-display-295.cfm

Fraihat, H. Department of Statistics [Jordan] and Macro International Inc, Calverton, Maryland, USA: Department of Statistics and Macro International Inc. (2008). *Jordan population and health survey 2007*. Retrieved from MEASURE Demographic and Health Survey website: http://www.measuredhs.com/what-we-do/survey/survey-display-295.cfm

Hale, R. (2007). Infant nutrition and the benefits of breastfeeding. *British Journal of Midwifery*, *15*(6),368-371

Hazir, T., Akram, D., Nisar, Y., & Kazmi, N. et al (2012). Determinants of suboptimal

breastfeeding practices in Pakistan. *Public Health Nutrition*, *16*(4), 659-672.

Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS; Bellagio Child Survival Study Group. How many child deaths can we prevent this year? *Lancet* 2003;362:65–71

Karacam, Z. (2006). Factors affecting exclusive breastfeeding of healthy babies aged zero to four months: a community-based study of Turkish women. *Journal of Clinical Nursing*, *17*(3), 341-349.

Khassawneh, M., Khader, Y., Amarin, Z., & Alkafajei, A. (2006). Knowledge, attitude and practice of breastfeeding in the north of Jordan: a cross-sectional study. *International Breastfeeding Journal*, 1(17), 250-256

Koyanagi, A., Humphrey, J., Moulton, L., Ntozini, R., Mutasa, K., Iliff, P., & Black, R. (2009). Effect of early exclusive breastfeeding on morbidity among infants born to hiv-negative women in Zimbabwe. *American society for nutrition*, *89*, 1375-82.

Kramer MS, Kakuma R. The optimal duration of exclusive breastfeeding. A systematic review. Adv Exp Biol 2004;554:63–77.

Kuguoglu S., Yildiz H., Tanir MK. & Demirbag BC. (2012). Breastfeeding after a Cesarean Delivery, Dr. Raed Salim (Ed.), ISBN: 978-953-51-0638-8, InTech, Available from: http://www.intechopen.com/books/cesarean-delivery/breastfeeding-after-a-cesarean-delivery.

Lawoyin, T. O., Olawuyi, J. F., & Onadeko, M. O. (2001). Factors associated with exclusive breastfeeding in lbadan, nigeria. *Journal of Human Lactation*, *17*, 321-325.

LINKAGES LAM Project, Jordan, 1998-2004: Final Report," Washington, DC, 2004 retrieved from www.linkagesproject.org/country/Jordan.php

Ludvigsson, J., & Ludvigsson, J. (2005). Socio-economic determinants, maternal smoking and coffee consumption, and exclusive breastfeeding in 10205 children. *Acta Paediatrica*, 94, 1310-1319.

Majcher-Teleon, A., & Ben Slimène, O. European Union, (2009). Women and work in Jordan, case study of tourism and ict sectors European Training Foundation.

Mihrshahi, S., Kabir, I., Roy, S., Agho, K., Senarath, U., & Dibley, M. (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.

McNiel, M., Labbok, M., & Abrahams, S. W. (2010). What are the risks associated with formula feeding? A re-analysis and review. *Breastfeeding review*, *18*(2), 26-32.

Mubaideen, M. M., & Al Saraireh, R. M. (2006). Breastfeeding patterns in selected antenatal care clinics in Jordan. *Journal of research in medical sciences*, *13*(2), 74-78.

Nyanga, N., Mustia, C., Otieno, A., & Kaseje, D. (2012). Factors influencing knowledge and practice of exclusive breastfeeding in Nyando district, Kenya. *African Journal of Food*, Agriculture, Nutrition and Development, 12(6), 6632-6645.

Oddy. W.H., Li, J., Robinson., M., & Whitehouse, A.J.O (2012). The Long-Term Effects of Breastfeeding on Development, *Contemporary Pediatrics*, Dr. Öner

Özdemir (Ed.), ISBN: 978-953-51-0154-3, InTech, Available from: http://www.intechopen.com/books/contemporary-pediatrics/the-long-termeffects-of-breastfeeding-on-development

Olang, B., Farivar, K., Heidarzadeh, A., Strandvik, B., & Yngve, A. (2009). Breastfeeding in Iran: prevalence, duration and current recommendations. *International Breastfeeding Journal*, *4*(8).

Örün, E., Yalçın, S., Madendag, Y., & Üstünyurt-Eras, Z. (2010). Factors associated with breastfeeding initiation time in a baby-friendly hospital. *The Turkish Journal of Pediatrics*, *52*, 10-16.

Oweis, A., Tayem, A., & Froelicher, E. (2009). Breastfeeding practices among Jordanian women. *International Journal of Nursing Practice*, (15), 32-40.

Perera, P., Ranathunga, N., Fernando, M., Sampath, W., & Samaranayake, G. (2012). Actual exclusive breastfeeding rates and determinants among a cohort of children living in Gampaha district Sri-Lanka: A prospective observational study. *International Breastfeeding Journal*, 7(21),

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

Saki, A., Eshraghian, M., Mohammad, K., Foroushani, A., & Bordbar, M. (2010). A prospective study of the effect of delivery type on neonatal weight gain pattern in exclusively breastfed neonates born in Shiraz, Iran. *International Breastfeeding Journal*,*5*(1), doi: 10.1186/1746-4358-5-1

Salone, L., Vann, W., & Dee, D. (2013). Breastfeeding: An overview of oral and general health benefits. *The Journal of the American Dental Association, 144*(2), 143-151.

Semenic, S., Loiselle, C., & Gottlieb, L. (2008). Predictors of the duration of exclusive breastfeeding among first-time women. *Research in Nursing & Health*, 31, 428-441.

Sweidan, M., Mahfoud, Z., & DeJong, J. (2008). Hospital policies and practices concerning normal childbirth in Jordan. Studies in Family Planning, 39(1), 59-68.

UNICEF and the Global Strategy on Infant and Young Child Feeding (GSIYCF), Understanding the Past – Planning the Future, 2003, retrieved from http://www.unicef.org/nutrition/files/FinalReportonDistribution.pdf

UNICEF the state of the world children 2012, children in an urban world retrieved from http://www.unicef.org/sowc/files/SOWC_2012.Main_Report_EN_21Dec2011.pdf

Van der Wijden C, Brown J, Kleijnen J. Lactational amenorrhea for family planning. *Cochrane Database of Systematic Reviews* 2003, Issue 4. Art. No.: CD001329. DOI: 10.1002/14651858.CD001329.

World Health Organization. (2013). *Health Topics, Breastfeeding*. Retrieved from http://www.who.int/topics/breastfeeding/en/

World Health Organization. (2012, July). *10 facts on breastfeeding*. Retrieved from http://www.who.int/features/factfiles/breastfeeding/en/index.html

World Health Organization (2002). World Health Report, Reducing Risks, Promoting Healthy life. WHO, Geneva, 67-70

World Health Organization and UNICEF (2013). Accountability for maternal, newborn and child survival. The 2013 Update.