EXCLUSIVE BREASTFEEDING AND INFANT MORBIDITY IN INDONESIA

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ABSTRACT

The study aims to examine the effect of different types of infant feeding on infant morbidity in Indonesia, particularly diarrhea and acute respiratory infection, and to determine which populations breastfeed their babies exclusively, partially or not at all.

Indonesia Demography and Health Survey data were used in this study with a sample of 3418 mothers aged 15-49 who had babies up to eleven months of age. The data was analyzed by cross tabulation (Chi-square) and binary logistic regression. Four group variables were involved in this statistical package: circumstances of the pregnancy and delivery i.e. access to things such as ante-natal care and hospital birth, mother's socioeconomic profile, father's socioeconomic profile, and environmental factors in the baby's community.

From this sample, at nearly 98 percent, we can say that breastfeeding prevalence in Indonesia is high. Indonesian mothers consider that breast milk is a normal food for their babies. However, exclusive breastfeeding in the first six months is uncommon. Lack of knowledge of exclusive breastfeeding and many other problems are hindering its adoption. Exclusive breastfeeding in the first six months can reduce the rate of diarrhea and acute respiratory infection not only because of breast milk content but also because contaminated utensils are avoided. It was found through Chi-square analysis (but not in multivariate analysis) that exclusive breastfeeding was strongly related to the lowest rates of infant diarrhea and acute respiratory infection. Some background characteristics are significantly related to lower rates of exclusive breastfeeding such as a high frequency of ante-natal care visits, assisted delivery by modern birth attendants, delivery at hospitals, low parity, the infants being given pacifiers, highly educated mothers, high maternal economic level, mothers living in urban areas, highly educated fathers, and professional fathers and higher infant age (Chi-Square). However, in multivariate analysis only two significant variables were found, namely, the use of pacifiers and higher infant age. This correlation was not confirmed in multivariate analysis. The differences between chi-square and multivariate analysis could be due to the small sample size of women who exclusively breast fed in the first six months.

In order to increase exclusive breastfeeding practices and reduce infant morbidity, intervention programs should increase the knowledge and awareness of risk of infant morbidity and stress the need for improvements in the standard of sanitation.

KEY WORDS: EXCLUSIVE BREASTFEEDING/ MOTHERS/ INFANT
DIARRHEA/ INFANT MORBIDITY/ ARI/ INDONESIA

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INTRODUCTION

1.1 Situation of Exclusive Breastfeeding

To breastfeed the infant exclusively up to 6 months is one of the most important contributing factors to the neonate's and infant's growth, and survival (Prentice, 1996; Kramer et all., 2002; Shrimpton et al., 2001). Exclusive breastfeeding can protect babies from early illness, particularly diarrhea, acute respiratory infection and malnutrition because of the content of breast milk. Immunity agents, nutrients and growth factors in breast milk can fulfill infant needs for health and growth within the first 6 months (Prentice, 1996; Kramer et all, Shrimpton et al., 2001; Chandra, 1979). Breast milk is suitable to the infant digestive system, easy to digest and can prevent contamination to utensils. Immunity agents in breast milk not only protect the baby actively but also passively through stimulating baby's antibodies. Early initiation of breastfeeding protects the newborn baby from early contamination to a new environment which contains lots of bacteria and provides antibodies in the infant body. Also, it helps the newborn baby avoid other diseases such as jaundice, hypoglycemia, hypothermia (WHO/UNICEF, 1996; Prentice, 1996; Iqbal and Khana., 1990).

Commonly there are three types of infant feeding; those are exclusive breastfeeding, partial breastfeeding and non breastfeeding. Each type of infant feeding will influence the infant's health. Previous study reported that there are different effects on infant morbidity and mortality among exclusive breastfeeding, partial breastfeeding and non breastfeeding. The diseases that are strongly correlated with not exclusive breastfeeding are diarrhea and acute respiratory infection (Iqbal and Khana., 1990; Arifeen et al., 2001; Victora et al., 1999; Howie et al., 1990; Scariati et al., 1997; Huffman and Lamphere, 1984). Also these diseases are the most common causes of infant morbidity as well as infant mortality world yet do including Indonesia (Indonesia Health Department, 2000; Iqbal and Khana., 1990). The World Health

Organization 1990 also estimated that 14.6 million children under the age of five died annually in the developing countries due to three most common causes: a). Diarrhea (4 millions), b) Infection, particularly acute respiratory infection (2.8 millions) and c) Malnutrition (Iqbal and Khana., 1990).

Generally, breastfeeding's prevalence and duration in Asia, Africa, and some Caribbean and Latin American countries is high, but exclusive breastfeeding is low (Nelson, 2003). The duration of breastfeeding trends is slightly declining particularly in urban areas, and among educated women, working women and high family income women (Suyono, 1990; Iskandar, 1990; Iqbal, 1990). This trend is also reported in many countries such as Bangladesh, Senegal, Tanzania, Jordan, Philippines, Haiti, etc (Nelson, 2003). Some cities in China have reported that the pattern of breastfeeding is varied, but recently it tends to decline in prevalence as well as in duration (Lie-ying et al, 1994)

The problem of promoting exclusive breastfeeding rate up to 6 months and breastfeeding partially in the second six months is not easy to solve. One attempt to improve the rate of breastfeeding is a guideline for establishing policies toward increasing the rate of breastfeeding. There is a global agreement that exclusive breastfeeding has been promoted in almost of all countries in the world (WHO/UNICEF, 1996). The expected result is that the more the baby receives breastfeeding the lower the chance for the baby to get diarrhea and acute respiratory tract infection (Bushra et al., 1995).

The lower rate of exclusive breastfeeding and early initiation half to one hour after birth are prevalent in Indonesia too. Recently, Indonesia Demographic and Health Survey (IDHS) 2002-03 found that the prevalence rate and average duration of breastfeeding was high (96%) but exclusive breast-fed infants for 4 months and initiation of breastfeeding at the first 24 hours was low (14.7% and 27% respectively). This rate has decreased compared to IDHS 1997 data. Therefore the probability of an infant to be exposed to a very early morbidity risk is high and the advantage of immunological protection from colostrum is reduced (Iskandar, et al 1990). At the same time the percentage of poverty is high since the economic crisis came in 1997. This means that be made to affordable foods alternative for the babies are not much

available (IDHS 2002-03). These circumstances lead the infant to malnutrition, and vulnerable to get infection. For this reason awareness to promote breastfeeding and exclusive breastfeeding is highly recommended.

There are many problems that hinder the adoption of exclusive breastfeeding in Indonesia. Researchers have reported that there are social cultural changes concerning the role of women, the increasing number of educated women, working women, economic circumstances are determinants influencing the mother's choices to feed their babies. Commercial milk advertising and hospital failure to implement rooming-in also plays a role in the mother's decision. (Suharyono & Matulesy, 1997; Dixon, 1992; Suyono, 1990). There is a great need to continuously promote and to strengthen the policies toward breastfeeding.

The policies regarding breastfeeding is purposed to improve the rate of exclusive breastfeeding up to 6 months. Rooming-in is one of the attempts to increase the rate of early initiation of breastfeeding half to one hour after delivery. Breastfeeding rooms in the workplace, malls are other efforts to create favorable conditions for mothers. Infant milk advertising should not be allowed to arrange sample milk for newborn babies. It is an important factor to help the mother's decision (Suharyono and Matulesy, 1997).

1.2 Background of the Study Area

The size of Indonesian population was projected to be 211.1 million in year 2002. This means that Indonesia is the fourth most populous country in the world after China, India and United State of America. This population is spread unevenly over the country among 30 provinces and 17,000 islands with a land area of 1.9 million square kilometers. Population density varies between islands and between provinces within islands. For example there are 12,700 persons per square kilometer in Jakarta, 726 persons per square kilometer in East Java, and 20 persons per square kilometer in Kalimantan. Nationally Indonesian population density has increased from an estimated 93 per square kilometer in 1990 to 112 in 2002. A person living in urban areas was estimated to be 92.7 million (44%) in 2002, an increased compared to 86.5 million in 2000 (42%). Population growth has declined from 1.98% in 1980 to 1.25% in year 2002 (Central of Bureau Statistics, 2003).

The proportion of infants was 2.06% and infants under 6 months were 1.1%. Infant Mortality Rate (IMR) was 35 per 1000 live births in 2002-2003. It has decreased from 51 per 1000 live birth in 1997 (Central of Bureau Statistics, 2003).

Many maternal factors regarding mothers influenced the rate of infant mortality as reported in IDHS 2002-03 (perinatal and postnatal) such as socioeconomic factors of mothers including educational attainment, place of residence, wealth index quintile; biodemographic determinants including mother's age at first birth, birth interval, parity, antenatal care, place of delivery; and environmental contamination including safe water, toilet facilities, washing hands. Socioeconomic factors operate through the proximate determinants (Central of Bureau Statistics, 2003).

1.3 Problem identification and justification

In the past 20 years the Indonesian government has awareness toward the importance of breastfeeding for infant health. The high rate of infant mortality and infant morbidity in Indonesia can be prevented by breastfeeding in the appropriate way (IDHS, 2002-03).

IMR in Indonesia has decreased significantly in the past 20 years. The decreasing IMR is related to improvements in health facilities and accessibility. The policies to serve the poor free of charge since economic crisis in 1997 are helpful. However the rate of IMR is still high compared to the Philippines, Malaysia, and Thailand (Indonesia Health Profile 2000). In 1992 diarrhea caused 11% of infant deaths and increased to 13.9% in 1995. Acute respiratory tract infection (ARI) caused 36% of infant deaths in 1992. And 29.5% causes of infant deaths in 1995 (Health Profile 2000). In 2002-2003 infant younger than 6 months with diarrhea was 8.7% and for 6-11 months was 19.4%. And infant younger than 6 months with ARI was 6.3% and for 6-11 months was 9% (IDHS, 2002-03)

A presidential decree was issued in 1974 that mothers should return to breastfeeding. The main purpose of the national policy was to create an environment favorable for breastfeeding. The emphases were on increasing the duration of breastfeeding until 24 months and exclusively breastfeeding for 4 months. To achieve this aim, in 1977, the government banned television advertisements of all kinds of

infant food substitutes and issued instructions to manufacturers to label explicitly stating that they should not be used by infants especially in the first 6 months (Surharyono and Matulesi, 1997). Also in hospitals and clinics in early 1980 a pilot project of rooming-in began in a Jakarta teaching hospital and has gradually expanded to selected hospitals in other regions. A policy to promote breastfeeding integrated into the National Family Planning under the new initiative "Safe Motherhood and Childhood" in 1989 was another effort to increase the level of breastfeeding (Suyono, 1990).

Even though government policy has been launched to create an environment favorable for breastfeeding the rate of exclusive breastfeeding is still low. The Indonesian Demographic and Health survey (IDHS) 2002-03 revealed that exclusive breastfeeding up to 6 months had declined compared to data from Indonesia Demographic and Health survey (IDHS) 1997. In 1997, the average duration of breastfeeding was 23.1 months, initiation of breastfeeding at first 24 hours was 53 % and exclusive breastfeeding was 52% below 4 months (IDHS, 2003). Data, in IDHS 2002-2003 found prevalence rate was high (96%), average duration of breastfeeding was 22.3 months and exclusive breast-fed for 4 months 14.28%, below 4 months was 39.5%, below 2 months was 64%. Initiation at first 24 hours was 27 %. At the same time acute respiratory infection and diarrhea are remaining the first second and third causes of infant morbidity as well as infant mortality in Indonesia (Indonesia Health Profile, 2000). These diseases are known to correlate highly with non breastfeeding infants (Arifeen et al., 2001; Victora et al., 1999; Howie et al., 1990; Scariati et al., 1997; Huffman and Lamphere, 1984).

This study will examine the effect of different types of infant feeding on infant morbidity particularly diarrhea and acute respiratory infection in Indonesia. The aim of this study is to explore the situation of exclusive breastfeeding and the effect on the rate of infant morbidity and which factors is more influence the rate of exclusive breastfeeding in Indonesia. Thus, this study will reveal which types of infant feeding is the best method to reduce infant morbidity in Indonesia.

1.4 Research Question

How different types of infant feeding relate to diarrhea and acute respiratory infection of infants in Indonesia.

1.5 Objectives

1.5.1 To identify which population is more likely to give breastfeeding partially, exclusively, predominantly or none to the babies.

1.5.2 To explore the relationship between the different types of infant feeding and diarrhea and ARI in infants in Indonesia.

1.6 Limitation of Study

- This retrospective study is not the best design to use in looking for causality; therefore the results of this study must be confirmed with a better-designed study.
- Misdiagnoses of a diarrhea might result in a detection bias leading to an underestimation of the protective effects of breast-feeding.
- Diarrhea have specific differentiate pattern by the season, it was difficult to be taken into account in this study.
- Definition of exclusive breastfeeding and predominantly breastfeeding can be misspecified.
- The population in this study included infants 0-7 days and might be overestimated of effect of breast feeding on infant morbidity because infant's morbidity in 0-7 days might be related to delivery events.
- This study lacks of another environment factor such as washing hands and this might result in a detection bias leading to overestimation of breastfeeding effect on infant morbidity.
- This study does not examine weight at birth, whether low birth rate or normal weight.

CHAPTER 2
LITERATURE REVIEW

2.1 Infant Morbidity

The occurrence of various symptoms of infections is seen since the first two weeks of the infant's life. This was found in a longitudinal study on infant feeding in Sweden. The incidence rate of respiratory infection, gastroenteritis, viral/bacteria and alergic symptoms were found during infancy even among exclusive breastfed infants and it increased over time (Aarts, 2001). However exclusive breastfeed infants were less likely to suffer infections compared to infants who received formula in addition to breast milk (Howie et al., 1990; Aarts, 2001), even in a highly affluent society (Aarts, 2001).

The diseases such as diarrhea and acute respiratory infection are well known to be associated with discontinuation of breast-feeding (Howie et al., 1990; Scariati et al., 1997; Victora et al., 1987; Aarts, 2001; Black et al., 1984) such will be discussed in the next part.

2.1.1 Diarrhea in Infants

Diarrhea is commonly defined as an increase in the frequency and fluidity of bowel movements relative to the usual pattern of each individual. The high correlation between diarrhea as a disease and infant feeding is well documented (Howie et al., 1990; Scariati et al., 1997; Victora et al., 1987; Aarts, 2001; Black et al., 1984). Diarrhea incidence also is associated with the environmental sanitation such as availability of safe water, toilet facilities (Huffman, 1984), dirty floor (Gebramariam, 1984), individual hygienic behavior such as preparation of weaning food, boiling of drinking water (Black, 1984) and not washing hands using soap (Huffman, 1984).

This disease remains the most important public health problem because diarrhea is a major contributor to infant illness and leads to infant death. World Health Organization (WHO) 1982 estimates in developing countries three-quarters of a billionepisodes of diarrhea occur each year and causing 5 million deaths (Black, 1984). And then, in 1990 WHO also estimates that 4 million children under five die annually in developing countries because of diarrhea diseases (Iqbal and Khana., 1990).

2.1.2 Acute Respiratory Infection (ARI).

Acute respiratory infection (ARI) is a disease characterized by symptoms such as having a cold, cough, with or without rapid breath or difficult breath (Central of Bureau Statistic, 2002-03). Like diarrhea incidence of ARI is correlated to infant feeding. Exclusive breast feeding particularly is associated with a significant reduction in childhood respiratory illness (Wilson et al., 1998; Victora et al., 1999; Oddy et al., 2002; Aarts 2001). Hospital admission because of ARI has correlated to breastfeeding infants. For instance, a study was carried out in Australia have found that predominant breast feeding for less than six months was associated with an increased risk for two or more hospital, doctor, or clinic visits and hospital admission for wheezing lower respiratory illness (Oddy et al., 2003).

2.2 Breastfeeding

Breastfeeding is an unequalled way of providing ideal food for the healthy, growth and development of the infant. It is also an integral part of the reproductive process with important implications for the health of the mother. As a global public health recommendation, infants should be exclusively breastfeed for the first six months of life to achieve optimal growth, development, and health (WHO, 2003; Kramer et al., 2003; Prentice, 1996).

2.2.1 Different Types of Infant Feeding

Many studies as cited in Wray article have revealed that there is a different effect on infant morbidity and mortality from exclusive breastfeeding, partial breastfeeding or non-breastfeeding (Wray, 1979). Some articles mention full, partial, and artificial breastfeeding, some articles prefers to focus on exclusive breastfeeding, predominantly, and artificial or bottle feeding. Type of infants feeding according to the definition of WHO, and international agreement from (Lubbock and Krasovec, 1990) Include:

1. ***Exclusive breastfeeding***: The infant has received only breast milk from the mother or a wet nurse, or expressed breast milk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines. Exclusive breastfeeding included early initiation of breast milk without prelacteal feeding.

2. ***Predominant breastfeeding:*** The infant's predominant source of nourishment has been breast milk. However, the infant may also have received water and water-based drinks (sweetened and flavored water, teas, infusions, etc.), fruit juice; oral rehydration salts solution (ORS), drop and syrup forms of vitamins, minerals and medicines, and ritual fluids (in limited quantities). With the exception of fruit juice and sugar water, no food-based fluid is allowed under this definition.

3. ***Partial breastfeeding (complementary feeding):*** defined as the way of feeding to infant with mixed feeding. It is breastfeeding and other liquid or semi-solid food, designated at high, medium, or low.

4. ***Non breastfeeding*** defined as the way of feeding to child where the child has received liquid or semi-solid food from a bottle with a nipple/teat.

The different effects of breastfeeding or non-breastfeeding are reported in both developing countries and also in developed countries.

For example, a study was conducted in Scotland. There is an association between exclusive breastfeeding and a decrease of occurrence of infection symptoms. It revealed that during the 1st 13 weeks, the adjusted rate (corrected for social class, maternal age, and parental smoking) for gastrointestinal illness was 2.9% among fully breastfed and 5.1% among partially breastfed infants compared with 15.7% among bottle-fed infants and 16.7% among weaned infants (Howie et al., 1990). A similar result is found in New Zealand by Ferguson, et al 1978 reported in Iqbal and Khana's article (Iqbal and Khana., 1990) Sweden (Aarts, 2001), and in Australia among predominantly breastfeeding (Oddy, 2002). How ever a different result has found in a study in USA. The result showed the different affect on infant morbidity only among non breastfeeding infants (Scariati et al., 1997).

The different effects of infant feeding also were found in developing countries. In Brazil, a study was carried out in 1987, among infants with different kind of infant feeding. They have found the rate of infant bottle feeding 16 times higher than breastfeeding infant in getting diarrhea (Iqbal and Khana., 1990). In Delhi, India a study in 1987, found the average of infant morbidity was 4 episodes per child annually, as compared 14.4 episodes in artificial fed infant. Diarrhea occurred 5 times more frequently among artificially fed infants (Gupta, 2002). The rate of morbidity as reported in Indonesia 1982 particularly diarrhea and ARI 5 - 8 times higher among bottle fed infants (Suyono, 1990) and malnutrition also is found in the same group (Suyono, 1990). Similar results were found in Pakistan where bottle feeding infants got diarrhea more frequently and more severely and at earlier stage than did breastfed children (Bushra et al., 1995).

The previous study shows that of all the types of infant feeding, exclusive breastfeeding is the best to protect babies from diarrhea and acute respiratory infection whether in developed or developing countries.

2.2.2 Benefits of Breastfeeding

The knowledge that breastfeeding is benefits both the infant and the mother is well documented. The nutrient composition of breast milk is ideal enough to fulfill the needs of newborn baby and infant in the first 6 months. Breast milk is produced in enough amounts, and will increase according to how frequently they are breastfeeding (Jellife, 1979; Butte et al., 2002; Prentice, 1996).

Breast milk a new, cheap, safe, orally administered vaccine requiring no cold-chain became available that could prevent one million or more child deaths a year, it would become an immediate public health imperative. Breastfeeding can do all this and more (Gupta, 2002).

2.2.2.1 Breastfeeding provides optimal nutrient

All the nutrients needed for babies growing normally (Kramer et al., 2003; Smidt et al., 2002; Prentice, 1996), and healthy are included in breast milk exclusively in the first 4-6 months (Prentice, 1996). Supplemental food such as vitamin, mineral or other nutrient is not needed in this period. Although breastfeed exclusively up to 4 or 6 months differ between infants individually and still a debate topic (Aarts, 2001). The composition of nutrient needed such as protein, carbohydrate, fat, minerals, vitamins are contains in breast milk in properly amount and those are easily and quickly digested (Prentice, 1996; Iqbal and Khana., 1990; Butte et al., 2002, Kramer et al., 2003).

2.2.2.2 Breastfeeding provides immunity

The benefits for babies are not only in nutrition but also as defence against disease including infectious disease; malabsorbtion and allergies are all recognized. Infant have immunity from a variety of microorganisms to which the mother was exposed while the infant was in the womb. When the infant starts breastfeeding, the additional immunity comes through colostrums and breast milk. Human breastmilk actively stimulates the infant's own immune response as well (Prentice, 1996; Chandra, 1979; Kramer et al., 2003).

Breastfeeding is associated with lower morbidity in comparison to artificial feeding in all ages are reported. For instance, in a study conducted in India and Canada 1979, has shown the different effects of protection among infants who are breastfed and infants artificially fed. Acute Respiratory Infection was over two times higher among artificially fed infants than breastfed infants both in India and Canada. And Diarrhea was over 3 times higher among artificially fed infants than breastfed infants both in India and Canada. Otitis Media has shown higher rates in both India and Canada. Dehydration among artificially fed infants was over 4 times higher than breastfed infants in India and Canada. This is evidence that the effect of immunity in breast milk to the wall of the infant's digestive tract is better than artificially fed so that the grade of disease is worst among artificially fed infants (Chandra, 1979). Similar studies have found the same situation in US, Sweden, and Australia (Kramer et al., 2003; Aarts, 2001; Oddy et al, 2003).

A study conducted in Eritrea in 1984 found infants aged 6-11 months had higher prevalence in getting diarrhea than children aged 0-5 years old. And the risk of getting diarrhea was over three times higher than those children aged 0-5 months. This pattern of diarrhea was retained even when other variables are controlled. The low risk of diarrhea among infants 0-5 months observed in this study clearly indicates the protective effect of exclusive breastfeeding in the first 6 months (Gebramariam, 1984).

2.2.3 Breastfeeding pattern and infant morbidity, mortality

The method of breastfeeding has effects on infant health and infant survival. Early half to one hour initiation of breastfeeding, breastfeed exclusively 4 to 6 months with hygienic environment, gives different result toward infant survival.

Commonly the problems of infant health regarding of infant feeding were basically related to compositions or incorrect formula, non-immunology protected and contaminations with infective agents. Diarrhea is seen as direct

effect of feeding. This disease can cause of contamination with infective agents or mal absorption (Jelife, 1979; Chandra, 1979; Prentice, 1996).

Some societies discarded colostrums such as in India some people perceived that breast milk “not good for baby heavy” because of the different appearance from commonly milk color, is transparent and yellowish (Dixon, 1992; Khan, 1990). The advantages of colostrums were neglected in many Asian countries. Even though, the baby having delivery in hospitals do not give colostrums. Several cities in Indonesia shown that initiation of breastfeeding tend to be postponed, moreover some incomplete support for infant ‘rooming-in” with mother is seen as well (Dixon, 1992). Though, many neonatal health problems are greatly recovered by appropriate pattern of breastfeeding. These include such conditions as hypothermia, neonatal hypoglycemia, infections, and neonatal jaundice which are associated with scheduled breastfeeding (WHO/UNICEF, 1996). Infants were whom breastfeeding initiated early had a lower rate of diarrhea than those initiated late (Clemen et al., 1999).

A study of recent survey data from 17 countries illustrates that the impact of breastfeeding when other factors which affect of mortality are accounted for, an infant is four times more likely to die if a mother stops any breastfeeding at age 2 to 3 months than an infant whose mother continues breastfeeding (Nelson, 2003). Infant who are exclusive breastfeeding from birth do suffer infection, but are less likely to do so than infants who receive formula in addition to breast milk even in a highly affluent society (Aarts, 2001). Those can be seen in the next explanation.

Many studies conducted in this topic found the higher rate of infant morbidity and mortality among non-breastfeeding infants than breastfeeding partially or exclusively. This result are reported from developed countries and developing countries such as New Zealand (Iqbal and Khana., 1990) a study in Bangladesh described breastfeeding practices and the influence of exclusive breastfeeding in early infancy on the risk of infant deaths, especially those attributable to respiratory infections (ARI) and diarrhea. They found that in comparison between exclusive breastfeeding in the first few months of life

partial or no breastfeeding was associated with a 2.40 and 3.94 fold higher risk of deaths attributable to ARI and diarrhea, respectively (Arifeen et al., 2001), similar result was reported in Latin America (Betran et al., 2001; Victora et al., 1999), Delhi India (Gupta, 2002), Indonesia (Iqbal and Khana., 1990) and Pakistan (Bushra et al., 1995). The different result was found in the US, that exclusive breastfeeding and partial breastfeeding have similar effect on infant diarrhea and acute respiratory infections (Scariati et al., 1997).

Found in 1990-2001 countries in Africa and Asia had high prevalence and duration of breastfeeding, but exclusive breastfeeding 0-3 months has low except in the Middle East, North Africa and Asia (Nelson, 2003). Practice of introducing complementary food at the appropriate time is increasing in 35 countries, but greater in Ghana, Bangladesh, and Uganda with multi surveys (Nelson, 2003).

In developed countries found the lower prevalence rates of breast-feeding compared within developing countries and the lower infant mortality rate as well. However a study from New Zealand, Scotland, and United State show, even when conditions are generally favorable for infant health and survival, breastfeeding can still contribute to improve infant health. That is the reason in developed countries; the attempting to increase the rate of breastfeeding through campaign and research is still done (Iqbal and Khana., 1990; Scariati et al., 1997; Howie, 1990). Even though prevalence rate and average duration of breastfeeding are high but early initiation and exclusive breastfeeding is still low. In developing countries is needed to increase exclusive and early initiation of breastfeeding to reduce detrimental effect of environment.

2.3 Background Characteristics

The decision of choosing the type of infant feeding is influenced by many factors in the mother's experiences. The decision to breastfeed is part of a broader cultural context of community norms and values involving the attitudes of social and family support and personal networks. Socio-demographic factors represent indirect predictors of breastfeeding behavior that may help identify

both the groups that are more favorably inclined to breastfeed and those that are more vulnerable (Ryan, 1997; Hodinnott et al., 1998; Aarts, 2001).

2.3.1 Socioeconomic Factors of Mothers

Sociodemographic factors of mothers not only influence the mother's decision in choosing the type of infant feeding but also influence the rate of morbidity as well as mortality. In the United States breastfeeding was highest among women who were college educated. For breastfeeding at 6 months of age, the declines were greater among those with less than a college education (Ryan, 1997; Arora et al., 2000). However a different result was found in China and Indonesia where it varies between islands, urban and rural areas (Iskandar et al., 1990; Li-Ying et al., 1994). It is the same in the Philippines (Wiliam, 1990).

Other research conducted in Eritrea confirmed the relationship between mother's education and infant diarrhea. The result shows significant negative association with risk of diarrhea in univariate model, but does not show any significant effect after adjusting for influences of other variables (Gebremariam, 1984). A similar result was found with Brazilian mothers (Sastry and Burgard, 2002).

The women who are employed part time have been traditionally more likely to practice breastfeeding in US (Ryan, 1997) but mothers returning to full-time work during the first year after birth also were associated with a shorter length of breast-feeding (Vogel et al., 1999). The working woman or those in non-agriculture work tend to give non-breastfeeding or breastfed shorter to their baby. It was found in Indonesia and China (Lukman et al., 1990; Li-ying et al., 1994 that mothers in paid employment in modern and transitional job are more likely to breastfeed shorter than non, traditional and mixed paid employee mothers (Wiliam, 1990). In every area in Indonesia in 1987, middle status occupations are associated with higher proportion not initiating breastfeeding than observed in the professional class (Iskandar et al., 1990).

The highest income group (≥$25 000) is the highest initiation of breastfeeding in US (Ryan, 1997). This is different from Indonesia, Philippines and China the higher income the mother become, the more likely they give shorter duration breastfeeding or non breastfeeding (Lukman et al., 1990; Li-ying et al., 1994; Wiliam, 1990). This is significant in rural outer Java-Bali (Iskandar et al., 1990). However infant diarrhea and the probability of having diarrhea are less likely in medium and high economic level than children in low economic group in Eritrea (Gebremariam, 1984).

It is possible to delegate choices toward breastfeeding available to mothers. In the rural areas in Indonesia it was found that most of the women breastfed their infant for a longer duration than in urban areas (Suyono, 1990). The result was similar to Thailand in 1987 and Philippines in 1983; but the duration of breastfeeding in urban areas increased in the last ten years (Iqbal and Khana., 1990; Wiliam, 1990). However, in urban area found that the children less likely to expose to the risk of getting diarrhea than children in rural areas as reported in some countries such as Eritrea. Explanation for this situation is the availability of better sanitation, accessibility to information to take care of children is high in urban areas (Gebremariam, 1984; Iqbal and Khana., 1990).

2.3.2 Birth Related Factors and Breastfeeding

Birth histories of mothers play a role in attempting to infant health. Some literature mentioned that prenatal, Place of delivery, and giving birth assisted by modern birth attendant have correlated to infant survival. In Indonesia mothers who did not have antenatal care and tetanus immunizations have higher chance to have infant death (Kasmijati et al., 1991, Bureau of statistics, 2003). Also mothers who give birth at hospital tend to give shorter duration of breastfeeding than mothers who give birth at home (Li-ying et al., 1994). The same significant result is found in rural Indonesia 1987 (Iskandar et al., 1990). Assistance in delivery by modern birth attendant is another factor to promote infants health. Mothers who are assisted by modern births attendants (midwife) tend to breastfeed low in initiating and shorter in duration than mothers who are assisted by traditional birth attendants (Li-ying et al., 1994). There is similar

result in rural areas in Indonesia (Iskandar et al., 1990). Post neonatal mortality was also higher among mothers who gave birth at home rather than in a health facility, who were assisted at delivery by non-medical staff, and who had lower levels of educational attainment (Kasmiyati et al., 1991).

The mean duration of breastfeeding increases as the mothers age increases. A study in the US revealed that prevalence of breastfeeding is low in young mothers (below 25 years old), but it was increased in 1989 among mothers younger than 20 (Ryan, 1997). A similar result was found in China where younger mothers (below 24 years old) at giving birth tend to breastfed shorter than older mother (above 25 years old) at giving birth (Li-ying et al., 1994). In Indonesia as reported in 1990, between Java-Bali and urban outer Java-Bali, young mother are more likely to breastfeed their infants than older mothers but in rural outer Java-Bali old mothers at giving birth in each level of parity are more likely not to breastfeed (Iskandar et al., 1990). Primiparous are less likely to breastfeed the babies but in 1989 it had increased (Ryan, 1997). It is the same as in Indonesia except in urban Java-Bali (Iskandar et al., 1990).

A study in Sweden revealed that the number of siblings associated with decreasing occurrences of respiratory symptoms in Swedish babies (Aarts, 2001). Short intervals between pregnancies are detrimental to fetal growth, though especially in low-mortality countries; this is partly an artifact of preterm delivery (Haaga, 1991). Also the levels of infant mortality were substantially higher when births were spaced closer together (Kasmiaty, et al., 1991).

Recently, there has been much discussion about pacifiers. According to the name pacifier is given because of the meaning. There is a calming effect they have on the child, and they are often used for this purpose (Aarts, 2001). A study in the US found the use of pacifiers in first 6 weeks was associated with a significantly increased risk for short duration of full and overall breastfeeding. Also women who introduced pacifiers tended to breastfeed their infants fewer times per day, and breastfeeding was inconvenient and that they had insufficient milk supplies (Howard et al., 1999; Aarts 2001). Pacifier use was associated with higher risk of symptoms of such as wheezing, earache, vomiting, fever,

diarrhea, colic and the general practitioner being called to the home and hospital admission **(**North et al., 1999**).** But in Sweden infants 0-3 months with pacifier were associated with decreasing occurrence of ARI symptoms (Aarts, 2001).

2.3.3 Fathers Factors

A high level of father's education is associated with a lower frequency of breastfeeding in Indonesia (Java-Bali) in urban and rural areas but this association significant only within rural areas. Among all urban outer Java-Bali spouses, there is some indication that those with junior high school or primary school education are less likely to breastfeed their babies than those in the most highly educated groups and similar results are found in China (Iskandar et al., 1990; Li-Ying et al., 1994). Father's education had only a small and insignificant effect on diarrhea rates (Sastry and Burgard, 2002).

Women with husbands engaged in agriculture occupations were more likely to breastfeed their infants than women who have husbands in non agriculture occupation (Li-ying et al., 1994). High annual income of father has a negative relationship with duration of breast-feeding in Philippines (Wiliam, 1990).

2.3.4 Environmental Factors Influencing Infant Morbidity

The environment is an important factor to take into consideration to reduce infant morbidity. There are many environmental factors that can influence the health of children. Some of them will be discussed here.

The number of children living in a house influences the probability of children getting diarrhea. The reason for this is over crowded condition; the mother pays attention in taking care of the children. A study in Eritera revealed that there is a significant association between the number of children living in a house and the incidence of diarrhea. There are higher chance of getting diarrhea among children who are living in a house with six or more others children than among children who are living in a house with children less than three (Gebremariam, 1984).

Breastfeeding, water supply and sanitation are major factors associated with declining prevalence of diarrhea. In 1996 was found that better water supply and good sanitation were significantly associated with lower rates of diarrhea (Sastry and Burgard, 2002). Standard of environment sanitation; access to safe water, healthy behavior such as washing hand have contributed to the level of infant morbidity and mortality as reported by Grant J.P. 1990 as cited in Iqbal and Khana's article. Availability of toilet facilities also showed a significant association with reducing diarrhea by 26% in multivariate model (Gebramariam, 1984). High level of economic development with more hygienic environmental standards and better access to health facilities in the developed countries helps to offset the detrimental consequences of lower prevalence and short duration of breastfeeding. Under these conditions those developed countries have shown low rates of infant mortality (Iqbal and Khana., 1990).

A study in Gambia by Barrel and Rowland (1979) found that food given to infants has a high level of bacteria (Huffman and Lamphere, 1984). Bacteria come not only from unboiled water but also from contaminated utensils used in food preparation. Even though the infant food was cooked, the level of bacteria was still high in an unacceptable level. Similar results were found in Indonesia in 1980 and in Bangladesh (Huffman and Lamphere., 1984). Colostrums also show bacteria antibodies in lower gut of mother, E. coli. This is an evidence that mother is contaminated by feces as well (Jeliffe, 1979).

When the load of infection is high the immunologic protection provided by breastfeeding is more important than when few infectious agents are evident. Availability of water reduces infection load by diluting and washing away the infectious agents. Studies also have shown the high general level of environmental contamination in poor household's effect on levels of contaminants on women's hands and breasts. Use of soap in hand washing has been shown to reduce spread of disease in family exposed to Shigelloses (Huffman and Lamphere., 1984). In Eritrea children living in the non-dirty floor are 43% less likely to get diarrhea than those children living in a houses with dirty floors (Gebramariam, 1984).

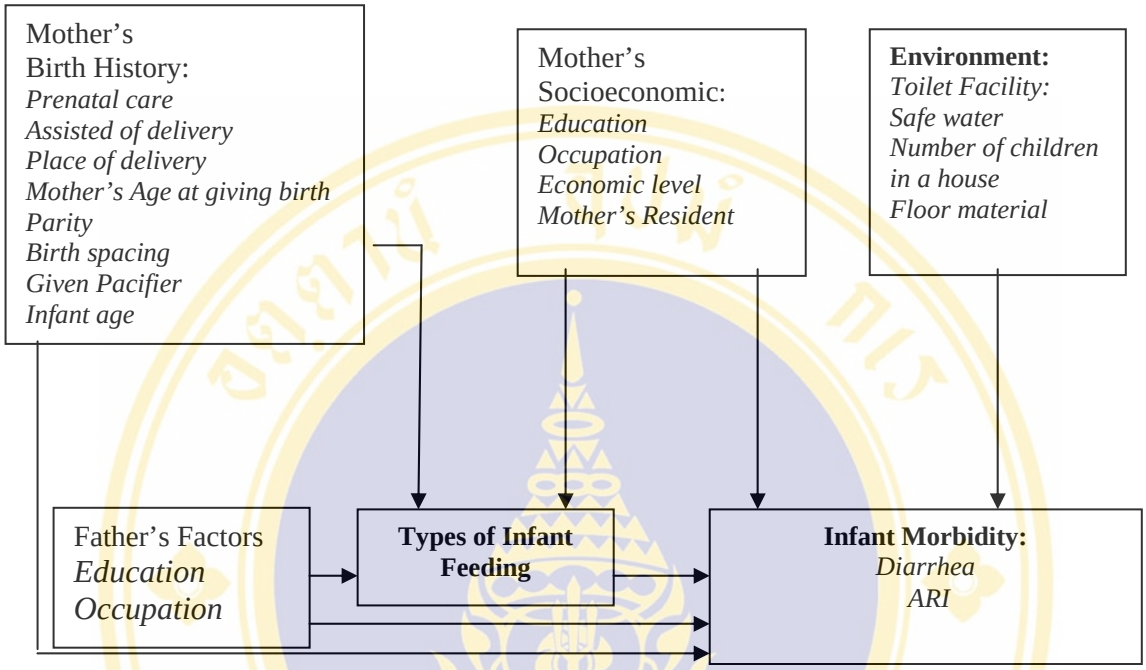
2.4 Conceptual Framework

The mother's factors influence the mother's decision not only to choose types of infant feeding but also the rate of infant morbidity. Among some of independent variables such as education, economic level, place of delivery and mothers' resident, can influence each other. Generally, lower prevalence of breast-feeding duration has found among women in higher economic level or those with high education, working women for salary, and work away or at home, women who are living in urban areas. Environment especially safe water, number of children living in a house, toilet facility has contributed to infant morbidity altogether with maternal factors and method of infant feeding to the baby.

The following variables are included in this study;

1. Mother's birth history: prenatal care assisted of delivery, place of delivery, mother's age at giving birth, parity, birth spacing, and infant age and given pacifier.
2. Mother's socioeconomic: Level of education, occupation, residence, and economic level.
3. Father's factors: Education and occupation.
4. Environmental factors: Toilet facility, safe water, floor material and number of living children in a house.
5. Types of infant feeding.

Conceptual Framework



2.5 Research Hypothesis

1. Infants who are exclusively breastfed have substantially lower levels of morbidity than infants having partial breastfeeding and those with no breastfeeding?
2. Infants who are not breastfed have higher risk of morbidity than infants who are breastfed partially and exclusively.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Source of Data and Sample Size

This study used secondary data from the Indonesia Demographic and Health Survey (IDHS) 1997. It was implemented in collaboration between the Central Bureau of Statistics, the State Ministry of Population/National Family Planning Coordinating Board (NFPCB), and Ministry of Health, with the assistance of Macro International Inc. This survey has conducted every 3 years, and IDHS 1997 was the fourth survey and carried out in September to December 1997.

The samples of the populations in this survey were ever married women ages 15-49 years old and currently married men ages 15-54 years old. The numbers of respondents were 34,255. They were interviewed from 27 provinces and 28,810 of households were identified. Female respondents were interviewed to achieve information on fertility, family planning, infant and child mortality, and maternal and child health.

The sample for the present study were ever married women of reproductive ages 15-49 years old, who had children up to 11 months of age. There are 3,418 pairs of mothers and infants.

3.2 Research Design

The sample population obtained in this survey was nationally representative. The sample was selected in three stages, the first stage, census enumeration areas (EAs) were selected systematically with probability proportional to population size. In the second step, from each EA segments of approximately 70 contiguous households with clear boundaries were formed. The third stage, 25 households were selected from each

segment using a systematic random sampling. In 1997 IDHS used three, questionnaires: the household questionnaire, the questionnaire on family welfare, and the individual questionnaires they were based on DHS model “A” questionnaires which are designed for using in countries with high contraceptive prevalence.

3.3 Data Analysis

Statistical Package for Social Science was used to analysis the data. Descriptive statistics was used to reveal the relationship between variables, followed by multivariate analysis to measure which independent variables have greater influence to dependent variables.

3.4 Limitation of Study

Many factors influenced infant morbidity as well as factors influence mother’s decision to feed the baby. However, this study has focused only on some selected factors which are more related to infant morbidity and depend on the availability of dataset. This study has conducted based on the current situation of breastfeeding rate and infant morbidity rate in Indonesia as mentioned in prior pages. Although the Indonesia Demographic and Health Survey 2002-03 was already conducted but the raw data was not yet available for the public used. Thus, this study used the data obtained from the year 1997 but the current situation of breastfeeding and infant morbidity may be better now.

3.5 Operational Definition

The following table explains how the variables were defined in this study.

3.5.1 Independent Variables

A. Mother's socioeconomic status

Variable Name	Description	Measurement Scale
Occupation	Current job of mother as a major source of income	1 = at home 2 = away
Education	Education of mother at the time of interview	1 = no education 2 = middle education (incomplete secondary school, primary school) 3 = high education (complete secondary school and higher)
Economic level	Total family possession including radio, bicycle, refrigerator, television, motorcycle, car. Count into price	1 = low (0-5,000) 2 = middle (6,000-29,500) 3 = high economic level (30,500 up)
Mother's resident	Place of residence at the time of survey	1 = rural 2 = urban

B. Mother's Birth History

Variable Name	Description	Measurement Scale
Prenatal care	Visits the prenatal clinic for checking up during pregnancy	1 = no visit 2 = visits < 4 3 = visits >= 4 times
Assisted of delivery	Birth attendant	1 = traditional birth attendant 2 = modern birth attendant
Place of delivery	A place at giving birth	1 = at home 0 = at hospital
Mother's Age at giving birth	Mother's age at the time she was giving birth.	1 = < 20 2 = 20 – 34 3 = 35-49
Parity	Number of children ever born and still alive	1 = 3-4 2 = 1-2
Birth spacing	Interval between the last children	1 = < 24 months 2 = 24-36
Pacifier use	Using Pacifier during breastfeed period	1 = no 2 = yes

C. Father's Factors

Variable Name	Description	Measurement Scale
Occupation	Husband as a major source of income	1 = Agriculture 2= Laborer 3= Professional
Education	Education of father at the time of interview	1 = no education 2 = middle education (incomplete secondary school, primary school) 3 = high education (complete secondary school and higher)

D. Environment Factors

Variable Name	Description	Measurement Scale
Toilet Facility	Availability of toilet in a house	1 = have no toilet 2 = have toilet
Safe water	Availability of drinking water	1 = from river or stream 2 = from unprotected well 3 = from Piped
Number of children in a house	Number of children living in a house.	1 = 3 - 4 children 2 = 1 – 2 children
Type of Floor	Material used for flooring in a house	1 = bamboo, natural 2 = brick, concrete 3 = tile, ceramic, marble

E. Infant feeding

Variable Name	Description	Measurement Scale
Type of Infant Feeding	Type of infant feeding	1 = Non breastfeeding 2 = Partial breastfeeding 3 = Exclusive breastfeeding

3.5.2 Dependent Variables

Variable Name	Description	Measurement Scale
Infant Morbidity	The relative frequency occurrence of illness (diarrhea and ARI) among infants up to 6 months	
Diarrhea	Presence or absence of diarrhea	1 = no 2 = yes
Acute Respiratory Infection (ARI)	Presence of cold, cough and or not other symptoms	1 = no 2 = yes

CHAPTER 4
RESEARCH FINDINGS AND DISCUSSION

This chapter presents the results of analysis on some socioeconomic characteristics including birth history of mothers, characteristics of fathers and characteristics of environment and their relationship with the type of infant feeding and infant morbidity among the population sample. Also, the relationship between the type of infant feeding by infant's age and infant morbidity are considered.

4.1 Background Characteristic and Type of Infant Feeding

4.1.1 Infant's age and breastfeeding status

Infant's ages are grouped into first three months (0-2 months) second three months (3-5 months) and last six months (6 to 11 months). It was found that partial breastfeeding is common, but to breastfeed exclusively up to the first six months is still rare in Indonesia and never breastfeed the baby is very small. Exclusive breastfeeding is suggested as the best infant feeding for the first six months of infant lives. It was found that 58% of infant's age 0 to 2 months had breastfed exclusively and in the second three months it was declined to 22.4%. Even though a big campaign was still going in this period not only by the government organization but also is involved by non government organizations thus the result of low breastfeeding of was unexpected. Four percent of the infants were still breastfed exclusively in the last six months. There is no recommendation for exclusive breastfeeding during this period because of insufficient nutrients in breast milk to fulfill infant's needs. In this data set, there is no explanation about the reason why the babies still breastfeed exclusively after six months. In my observation, the reason why the baby still breastfed exclusively for a long period was because babies refuse other foods, there is no other food available for baby because of poverty, a baby got sick when eating other foods. Non breastfeeding in all age groups is small (2.3% to 2.6%).

The reasons why babies stop breastfeeding or not breastfeeding were explored. So, infants who ever had breastfed in Indonesia were high in 1997 (97.6%). Duration of breastfeeding is not given here as it was found that 93.7% of the infants still had breastfeeding at the time of interview. However, it was evident that exclusive breastfeeding was low among Indonesian mothers.

4.1.2 Mother's Birth History and the Type of Infant Feeding.

The variables in Table 4.1 includes respondent's visit to ANC, having assisted delivery, place of delivery, age at giving birth, parity, birth spacing and given pacifier to the baby by the type of infant feeding. These background characteristics and the type of infant feeding were examined whether they have significant relationship or not. The next three characteristic ANC visits, delivery at hospital, and assisted delivery by modern birth attendant can increase child survival rate. The reason is that the management of pregnancy and giving birth are done by skilled providers. However, the result in this study found that even the mothers have contact with health provider through visiting ANC, giving birth at hospitals and assisted at delivery by health providers, attitude of mother in choosing exclusive breastfeeding did not change very much.

Table 4.1 shows that there is slightly declining in proportion of mothers giving exclusive breastfeeding by the frequency of ANC visits. Mothers who visit ANC should have a chance in getting knowledge of the benefit of exclusive breastfeeding because they met health providers. However, health providers probably failed to promote this knowledge to the mothers. Moreover, the marketing promotion of formula milk and commercial baby food products probably gained attention from the health provider who in turn does not strongly promote exclusive breastfeeding. The chi-square test shows the relationship is statistically significant between visit to ANC and the type of infant feeding.

The same reason also applies to the fact that the mothers were giving birth by traditional birth attendant and those giving birth at home. Mothers who gave birth by traditional birth attendant were more likely to have exclusive breastfeeding than those who gave birth at hospital or were assisted by modern birth attendant.

The percentage of mothers giving exclusive breastfeeding increases by age. The possible reason is that those younger mothers are not so patient with the baby, and have low responsibility in taking care of a baby compare with older mothers. However, the link between age of mother at giving birth and type of infant feeding has not significantly different.

Mothers with two parities gave exclusive breastfeeding more than those with three to four parities. Also, mothers giving frequent birth (having consequent birth in less than two years) gained exclusive breastfeeding more than those with longer birth spacing.

Giving pacifier to the baby had a significant relationship with choosing exclusive breastfeeding. Infants given pacifier had much lower rate of exclusive breastfeeding comparing those not having it (8.6 % VS 23.8%). Even though, given pacifier is convenience for mother but did not have any contribution to infant's health.

4.1.3 Mother's socioeconomic and the type of infant feeding

Four variables were tested in this group. These were mother's education, mother's occupation, mother's level of economic and mother's resident. Table 4.1 shows that all except mother's occupation have significant association to type of infant feeding. It was found that mothers with lower than secondary education had exclusive breastfeeding more than in higher education. Mothers who work away from home gained exclusive breastfeeding more than mothers who work at home. The explanation might be the mothers who work away from home got knowledge more than the mothers who work at home.

Economic level of mothers had significant relationship with having exclusive breastfeeding. Mothers in low economic status gained exclusive breastfeeding more than mother in higher economic status. High economic level of mothers in having more chance to buy expensive food, tended to look fashionable, and easy to meet health providers who can introduce alternative good quality of food from the famous company.

Mothers in rural areas had higher rate in giving exclusive breastfeeding their babies than women in urban areas ((24.4% and 16.8%). The possible reason is that

women in rural areas still adopted their traditional living style. And alternative food for baby was not much available there. Also, mothers in the rural areas had more time to take care of the babies by themselves. This relationship was statistically significant (p. value <001).

4.1.4 Characteristics of fathers and infant feeding

Two variables were examined in this group, father's education and father's occupation by the type of infant feeding. The associations of these variables were significant.

Fathers in professional works have lower rate in choosing exclusive breastfeeding (17.2%) compare to those in laborer and agriculture work (20.7% and 25.8%). Almost all fathers in professional work were earning money more than laborer, so that their statuses were in high economic level in supporting their wives to choose infant feeding. Agriculture fathers had higher probability rate in choosing exclusive breastfeeding. They could set up their working time and help their wives at home so that the mothers had more chances to breastfeed the baby exclusively.

A similar pattern to the mother's level of education that the more educated the fathers had the fewer rates in giving exclusive breastfeeding. Not educated fathers have higher rate in giving exclusive breastfeeding than the higher education fathers. These results are the same as what said in literature review.

Table 4.1 Background characteristics by types of infant feeding

Background characteristics	Different types of breastfeeding			
	None (N=83)	Partial (N=2567)	Exclusive (N=767)	Total (N=3417)
Mother's birth history				
Prenatal care				
No visit	2.5	72.1	25.4 *	100
Below 4 visits	1.8	73.3	24.9	100
4 visits and above	2.7	76.1	21.2	100
Assisted delivery				
Traditional birth attendant	1.9	73.1	25.1 **	100
Modern birth attendant	2.9	76.8	20.4	100
Place of delivery				
At home	2.0	74.1	23.9 **	100
Hospital	3.8	78.4	17.8	100
Age at giving birth				
Below 20	0.0	81.6	18.4	100
20-34	2.4	75.1	22.5	100
35 and above	2.9	74.5	22.6	100
Parity				
3-4 child	2.4	72.7	24.9**	100
1-2 child	2.5	77.0	20.6	100
Birth spacing				
below 2 years	1.9	71.2	27.0	100
2 years up	2.6	74.1	23.3	100
Early Pacifier				
Yes	11.7	79.7	8.6 **	100
No	1.1	75.1	23.8	100
Mother's Socioeconomic				
Education				
No education	2.7	75.1	22.2 *	100
Primary	1.9	73.9	24.2	100
Second and higher	3.0	76.5	20.4	100
Occupation				
At home	2.2	79.9	17.9	100
Away	2.6	75.8	21.6	100
High	4.8	77.8	17.4	100

Table 4.1 Background characteristics by the type of infant feeding (continued)

Background characteristics	Different types of breastfeeding			
	None (N=83)	Partial (N=2567)	Exclusive (N=767)	Total (N=3417)
Economic level				
Low	2.0	74.5	23.5 **	100
Middle	2.2	77.5	20.3	100
High	4.8	77.8	17.4	100
Place of residence				
Urban	3.3	80.0	16.8 **	100
Rural	2.1	73.4	24.4	100
Father's Factors				
Occupation				
Agriculture	2.1	72.1	25.8**	100
Laborer	2.3	77.0	20.7	100
Professional	4.0	78.8	17.2	100
Education				
No Education	2.4	75.6	22.0 *	100
Primary	2.1	73.3	24.7	100
Second and higher	2.7	76.6	20.6	100

* Significant at p-value < 0.05 ** Significant at p-value < 0.01

4.2 Background characteristic and infant morbidity

4.2.1 The type of infant feeding and infant morbidity by infant's age.

As seen in Table 4.2 the rate of infant morbidity is shown among infant age group and the type of infant feeding. There is a different pattern in each infant's age group in each type of infant feeding to get sick.

Looking at all ages group of infants exclusive breastfeeding has the lowest rate between the type of infant feeding to get diarrhea and ARI except among infants group ages 6-11 months. Partial breastfeeding had not much different from non breastfeeding in the rate of having diarrhea and ARI. In general, the risk of having diarrhea and ARI in the reference period reaches the peak at 6-11 months. Here illustrate that diarrhea and ARI increased in all types of infant feeding by increased of infant's age. Also it revealed that when the infant weaned the protection effect of breast milk against diarrhea and ARI decreased. Exclusive breastfeeding in the first six months of infant's age shows evidence that breast milk had protective effect against infection.

These result findings differ from infant's age six to eleven months. The probably reason is first, infants who were exclusively breastfeed in the second six months might have malnutrition because of insufficient nutrients in breast milk made them easy in getting infection. Second, in this period the babies are exposed to infective agent within their environment because the babies are bigger and they can go outside with the mothers or others. Also the babies might play on the floor. It is also easy for the baby to reach everything and put into their mouth. The same situation is found with ARI.

These figures drawn that not only breastfeeding influence infant's health to prevent infant from getting diarrhea and ARI. Babies weaning properly in the second six months of life is suggested to fulfill their needs. Environmental factors must be considered as well among the population of this study. Sixteen percent of mothers used safe water (piped), 48.8% have toilet included unhealthy toilet and only 14.3% live in a house with clean floor. Thus complementary food might have created unhygienic condition. This result was different from a study in the US that exclusive

breastfeeding infants and partial breastfeeding infants have the same chance of getting diarrhea (Scariati et al., 1997).

Table 4.2 Association of infant morbidity by age and types of feeding

Infant age group	Type of infant feeding	Infant morbidity	
		ARI (N=910)	Diarrhea (N=390)
0-2 months	non breastfeeding	11.1	0*
	Partial breastfeeding	12.1	6.2
	Exclusive breastfeeding	8.7	2.9
3-5 months	non breastfeeding	28.6 *	14.3 *
	Partial breastfeeding	25.7	10.8
	Exclusive breastfeeding	18.4	5.6
6-11 months	non breastfeeding	31.8	15.9
	Partial breastfeeding	35.7	15.7
	Exclusive breastfeeding	37.7	17.4

*Significant at p-value < 0.05

This association is statistically significant. Since, infants with exclusive breastfeeding have lower level of morbidity than infants who are partially breastfeeding and non breastfeeding, the hypothesis stated that infant who exclusively breastfed in suggesting period have associated with the lower rate of infants in having diarrhea and ARI is not rejected. And since non breastfeeding infants have lower level of morbidity than partial breastfeeding infants, the hypothesis stated that infants who not breastfeeding are having higher level of infant morbidity than partial breastfed infant is rejected.

4.2.2 Mothers birth history and infant morbidity

Table 4.3 gives association of mother's birth history including prenatal care, assisted delivery, place of delivery talking about mothers those met health providers in their birth history. Through this contact there is an expection that mothers got a lot of

knowledge for their infant's health. It was found that the relationship between those variables with diarrhea is statistically significant. And with ARI only prenatal care was significant. In general, all the mothers seeing health providers in their birth history had infants with fewer rate in having diarrhea and ARI. Here shows that health providers play an important role in the spreading of health knowledge to the mothers especially how to prevent diarrhea and ARI.

Mothers giving birth at ages 20 to 34 years old had the lowest rate of having infants with diarrhea and ARI. The younger and oldest mothers groups had the same rate of getting diarrhea but different in ARI. This maybe because mothers below 20 years old have less experience in taking care of their infants in comparison to group mothers 20-34, but mothers whose giving birth at the oldest age group usually were working mother. They had many responsibilities beside the baby. This pattern almost the same as in literature review. Low parity and birth interval below two years were associated to low rate of diarrhea and ARI, but different finding was reported the previous studies. However, these variables were not significantly different in the relationship with infants in having diarrhea and ARI.

Infants were given pacifier had higher rate in getting diarrhea and ARI than infants were not given pacifier (with pacifier diarrhea 16.5 % and not pacifier 11% and ARI with pacifier 35 % and not pacifier 25.9 %). It is easy to understand because pacifiers were using can be dirty and enter to infant mouth if pacifiers become an infants habit. Mothers can not control it all the time. Also infants with pacifier might be come from busy mothers. Mothers do not have enough time to take care the baby. This relationship is statistically significance. This result differs from infants in Sweden in having ARI that early pacifier associated with decreased of occurrence of ARI symptoms (Aarts, 2001).

4.2.3 Mother's socioeconomic and infant morbidity.

Socioeconomic characteristics of mother's have statistically significant relationship with infants in getting diarrhea in the different level except economic level. And also there have significant relationship between educated mothers with infants in having ARI. Mother's education is a key factors relating to infant health. A

great need to provide women with ability to acquire understand and act on information about how to raise healthy children. Here found that high educated mothers, mothers works at home, those living in urban areas and mothers in high economic level had association with the lower rate of infants diarrhea. Otherwise, those variables differ from the chance in getting ARI. Low educated mothers, mothers work away from home, mothers living in urban areas and mothers in low economic level related to higher chance to their infants in having ARI. It is known that educated mother take care the infant properly and also know how to provide food in appropriate way for their children. They had exposed to information for taking care the children. Mothers who work at home can control and take care their babies directly compare to the mothers who work away from home. And mothers in high economic level can provide good and hygienic environment and good food for their babies. Regarding place of resident and infant morbidity, it is possible that children in urban areas have access to meet safe water, toilet facility, and better hygienic environment than those living in rural areas. Those factors decreased the rate of diarrhea. Otherwise there is more pollution, crowded in urban areas than rural, that is good condition for spreading ARI.

4.2.4 Characteristics of fathers and infant morbidity

High educated fathers and in professionals work are associated with the lower rate of infant diarrhea. The association was statistically significant. Also high educated fathers and those fathers in labor work were associated with the higher rate of infants with ARI as they usually live in the urban areas with air pollution.

4.2.5 Characteristics of environment and infant morbidity

Environmental characteristics such as toilet availability, having fewer than three children in a house, using water from piped and living in a house with tile floor were associated with lower rate of infants in having diarrhea. It was also found that not having toilet, those were living with more than three children in a house, living in a house with brick and wood floor and using piped water were relationship with the higher rate of ARI. Surprisingly that those infants had no toilet facility had associated with high rate of ARI. This might be related to low education and low economic level.

Also some others factors are influenced mothers using piped water and higher rate of having ARI. However the significant relationship was found only between toilet availability and using water from pipe with infants in having diarrhea. And not having toilet and those were living with more than three children in a house with having ARI infants.

High rate of having diarrhea can be explained by unhygienic disposal of the baby stool, made easy to spread bacteria or viruses by contact. It was clear that water from piped are less contaminated than others. The possible reason also that this evidence comes from the mothers who provide food under unhygienic condition such as was not washing hands and utensils with soap. ARI probably comes from a crowded and dirty house then produce unhealthy air breath. As known that ARI is transmitted by air breathing and diarrhea is transmitted by contamination.

Table 4.3 Background characteristics and infant morbidity

Variables	Infant morbidity	
	ARI (N= 910)	Diarrhea (N=310)
Mother's birth history		
Prenatal care		
No Visits	18.6**	11.1 **
Below 4 visits	29.4	14.5
4 visits up	26.6	10.3
Assisted delivery		
Traditional birth attendant	27.3	13.7 **
Modern birth attendant	26.1	9.6
Place of delivery		
At home	27.0	12.3 **
Hospital	25.4	8.5
Age at giving birth		
below 20	26.5	12.2
20-34	26.4	11.1
35 and above	27.3	12.2
Parity		
3-4 children	26.7	11.4
1-2 children	26.6	11.4
Birth spacing		
below 2 years	25.5	9.2
2 years up	26	11
Early Pacifier		
No	25.9 **	11.0 **
Yes	35.0	16.5
Mother's Socioeconomic		
Education		
No education	21.2 *	10.8 **
Primary	28.0	13.9
Secondary and higher	26.2	8.7
Occupation		
At home	25	7.6*
Away	27.4	12.3

Table 4.3 Background Characteristics and Infant Morbidity (*continued)*

Variables	Infant morbidity	
	ARI (N= 910)	Diarrhea (N=310)
Economic level		
Low	27.6	10.8
Middle	26.4	13.9
High	23.5	8.7
Place of residence		
Urban	27.2	9.6*
Rural	26.4	12.1
Father's Factors		
Occupation		
Laborer	28.7 *	12.2 *
Agriculture	25.1	11.6
Professional	25.2	8.2
Education		
No Education	21.5	11.0*
Primary	26.6	12.8
Second and higher	27.3	10.3
Environment factors		
Toilet Facility		
No toilet	28.5**	12.6**
Yes	24.7	10.2
Number of children in a house		
3 above	32.2 **	13.5
less than 3	25.9	11.1
Type of floor material		
Dirty, bamboo	25.2	10.8
Wood and Brick	27.2	12.2
Tile, ceramic	25.8	9.4
Safe water		
River, stream	25.4	12.6 **
Protected well, pump	26.9	12.0
Piped	27.4	8.5
The type of infant feeding		
Exclusive	14.5 **	5.1**
Partial	30.3	13.3
Non breastfeeding	26.5	12.0

* significant at p-value < 0.05 ** significant at p-value < 0.01

4.3 Multivariate Analysis

Three tables are shown to explain the influence of background characteristics and the likelihood to choose exclusive breastfeeding; background characteristics and the likelihood of infant in getting diarrhea; and background characteristics and the likelihood of infant in getting ARI. The statistical methods employed in these tables are logistic regression method since a logistic regression method is appropriate when outcomes are dichotomous. All significant independent variables examined in bivariete, are reexamined by controlling all others independent variables in multivariate analysis to produce the result. All tables are given with estimated odds ratio with 95 % confident interval, shows the likelihood of characteristics background in choosing the type of infant feeding and the likelihood of getting diarrhea and ARI.

Table 4.4 shows that although all independent variables and type of infant feeding are significant in bivariete analysis as shown in Table 4.1 only two variables namely early pacifier and infant ages are significant. The possible reason might be because of almost all of the independent variables have correlated to each others. For instance, place of residence influence mothers works, level of education and economic level. Mother's birth history are influenced by socioeconomic factors of mothers. So that when all independent variables examined at the same time seems the interaction of background characteristics and predicted outcome shows insignificant.

Even though it was not significant, an interesting thing found in mother's birth history. Those mothers were contact with health providers have fewer number in choosing exclusive breastfeeding. It does mean that when mothers those met health providers they do not received complete knowledge for taking care a baby. In Indonesia clinics and hospitals those serve mother and child health have to teach basic knowledge of how to take care the baby. Looking at the result in table 4.4 seems that the process of transfers of information from health providers is inadequate in terms of choosing exclusive breastfeeding. In this case probably infant formula and food advertisement draw much attention from health providers by giving sample infant formula and food to the mothers and health providers. And in some activity related to infants, such as a national contest of prosperity of children under five, infant formula and food company always becomes a sponsor. Also in an activity of midwives such as

study tour, national congress infant formula and Food Company always come up with a special facility.

Infant with pacifier is statistically associated with choosing the exclusive breastfeeding. And the estimated odds of choosing exclusive breastfeeding among pacifier infants are 85 % less than infants not pacifier. This result can be understood because in the case of pacifier and choosing exclusive breastfeeding might be there is some others factors influence of choosing breastfeeding such as busy mothers (mother have many responsibilities). The similar significant association between infants age and choosing exclusive breastfeeding. Among infants aged 3-5 months, the odds of choosing exclusive breastfeeding was 80% less than infant's age 0-2 months. And among infants aged 6-11 months the odds of choosing exclusive breastfeeding was 98% less than infants 0-2 months. In other word, infant's age group 0-2 months is more likely to choose exclusive breastfeeding than infants's age 3-5 months. This result shows exclusive breastfeeding in infants 0-2 months were naturally. However, mothers lack of knowledge of exclusive breastfeeding.

It was interesting to see that educated mothers and mothers working away from home have higher rate in choosing exclusive breastfeeding than other categories, even though they were not significant. Probable reason is that educated mothers are not really in high education because there only were 37.7 %, mothers with higher than secondary school only 4.7%. Previous study mentioned in chapter 2 that mothers with high education are more likely not choosing exclusive breastfeeding.

Table 4.4 Multivariate analysis of determinants of exclusive breastfeeding

Variables	Odds Ratio	95%Confidence Interval	
Mother's birth history			
Prenatal care			
No visit ANC	1.00		
Below 4 visits	0.821	0.293	2.299
4 visits and above	0.686	0.257	1.827
Assisted of delivery			
Traditional birth attendant	1.00		
Modern birth attendant	0.885	0.468	1.675
Place of delivery			
At home	1.00		
Hospital	0.686	0.268	1.443
Mother's age at giving birth			
Below 20	1.00		
20-34	0.693	0.121	3.975
35 and above	0.962	0.158	5.845
Parity			
3-4 child	1.00		
1-2 child	0.655	0.362	1.183
Birth spacing			
Below 24	1.00		
24 and above	1.068	0.530	2.153
Early Pacifier			
No	1.00		
Yes	0.152 *	0.033	0.695
Mother's Socioeconomic			
Education			
No education	1.00		
Primary	1.520	0.457	4.133
Secondary and higher	1.519	0.279	3.410
Occupation			
At home	1.00		
Away	1.046	0.546	2.003

Table 4.4 Multivariate analysis of determinants of exclusive breastfeeding (continued)

Variables	Odds Ratio	95%Confidence Interval	
Mother's economic level			
Low level	1.000		
Middle level	0.667	0.353	1.261
High level	0.813	0.335	1.973
Mother's Resident			
Urban	1.000		
Rural	1.642	0.712	3.784
Father's Factors			
Occupation			
Agriculture	1.000		
Laborer	0.892	0.464	1.716
Professional	0.908	0.373	2.215
Education			
No Education	1.00		
Primary	0.489	0.131	1.826
Second and higher	0.447	0.108	1.856
Infant Age			
0 -2 months	1.00		
3 -5 months	0.198 **	0.110	0.358
6 -11 months	0.020 **	0.009	0.044

* Significant, p. value < 0.05. ** Significant, p. value <0.01

Table 4.5 gives estimated odds ratio and significant in 95 % confident interval from multiple logistic regression method. All independent variables are carried out in examining the likelihood of infants in getting diarrhea in the last 2 weeks prior the interview (dependent variable). It was found that two of 11 variables were reexamined had statistically significant in multivariate analysis after controlled by others variables, namely using pacifiers and infant ages. Among infants with pacifier, the odds of having diarrhea was 3.2 times higher than infants with no pacifier. The similar reason within bivariete analysis is applied here. It was also found that infants who were ages 6-11 months, the odds ratio of getting diarrhea was 4.93 times higher than infants 0-2 months. And infant ages 3-5 months have odds of getting diarrhea 2.010 times higher than infant's ages 0-2 months. We can conclude that increasing the infant's age also

increases incidence of diarrhea because increase the probability to expose to infective agents and malabsorbtion foods. The result was similar with bivariete result.

It was interesting that infant those delivered in hospitals, visited ANC and high educated fathers were high likely in getting diarrhea. Similar reason as in bivarite is applied here and educated fathers seem not influence mothers knowledge in looking after their children. Because in this population studies highly educated fathers included 44.1% and 7% higher than secondary school. However this association is not significant.

Table 4.6 shows that among six independent variables were significant in bivariete analysis, only four variables had significant relationship in multivariate analysis. And the association is less strong than in bivariete analysis except number of children living in a house and infant's age. Similar reason with explanation in Table 4.5 is applied in this interaction effect on dependent variables.

Among infants with pacifier, it was found that the odds of having ARI 2.081 times higher than no pacifier infants. Infants with pacifier are more likely to get ARI than infants with not pacifier. Among high educated mothers the odds of having ARI, 2.577 times higher than no educated mothers. This result shows that the higher education the mothers obtained the more likely their infants to have ARI. In this case probably some others factors are influenced such as allergic factors. However this association was insignificant.

There were strong association between having number of children more than three in a house and having ARI. Among having fewer than 3 children living in a house the odds ratio of having ARI was 54% less than among having more than 3 children living in a house.

Infant's age was strongly associated with getting ARI. Among infant's age 3-5 months, the odds of having ARI was 3.53 times higher than the infant's age 0-2 months. And infant's age 6-11 months, the odds of having ARI was 7.33 times higher than infant's age 0-2 months.

Table 4.5 Multivariate Analysis of Independent Variables and Infant Diarrhea

Variables	Odds Ratio	95% Confidence Interval	
Mother's birth history			
Prenatal care			
Not visit ANC	1.00 *		
Below 4 visits	1.897	0.560	6.423
4 visits and above	1.688	0.511	5.581
Assisted of delivery			
Traditional birth attendant	1.00		
Modern birth attendant	0.608	0.301	1.228
Place of delivery			
At home	1.00		
Hospital	1.435	0.614	3.353
Mother's Age at giving birth			
Below 20	1.00		
20-34	0.828	0.201	3.411
35 and above	0.714	0.162	3.151
Parity			
3-4 child	1.00		
1-2 child	0.954	0.517	1.760
Birth spacing			
Below 24	1.00		
24 and above	0.768	0.370	1.595
Early Pacifier:			
No	1.00		
Yes	3.292 **	1.494	7.25
Mother's Socioeconomic			
Education			
No education	1.00		
Primary	1.374	.457	4.133
Secondary and higher	.975	.279	3.410
Occupation			
At home	1.00		
Away	1.858	0.876	3.942

Table 4.5 Multivariate analysis of independent variables and infant diarrhea (continued)

Variables	Odds Ratio	95% Confidence Interval	
Economic level			
Low level	1.00		
Middle level	0.895	0.455	1.759
High level	0.795	0.300	2.107
Mother's Resident			
Urban	1.00		
Rural	1.362	0.540	3.432
Father's Factors			
Occupation			
Agriculture	1.00		
Laborer	1.003	0.493	2.040
Professional	0.973	0.370	2.561
Education			
No Education	1.00		
Primary	1.795	0.406	7.933
Second and higher	2.131	0.440	10.318
Environment factors			
Toilet Facility			
No toilet	1.00		
Yes	1.345	0.731	2.475
Number of children in a house			
3 and above	1.00		
less than 3	0.704	0.253	0.825
Floor			
Ground, bamboo	1.00		
Brick	1.099	0.501	2.413
Tile, ceramic	0.452	0.113	1.805
Safe water			
River, stream	1.00		
Protected well, pump	0.944	0.438	1.593
Piped	0.898	0.321	2.209
Type of Infant feeding			
Exclusive breastfeeding	1.00		
Partial breastfeeding	1.479	0.492	4.449
Infant Age			
0 -2 months	1.000		
3 -5 months	2.010	0.623	6.487
6 -11 months	4.931 **	1.651	14.724

* Significant at p-value < 0.05. ** Significant at p-value < 0.01

Table 4.6 Multivariate logistic regression analysis of independent variables and infant ARI

Variables	Odds Ratio	95%Confidence Interval	
Mother's birth history			
Prenatal care			
Not visit ANC	1.000		
Below 4 visits	2.143	0.880	5.215
4 visits and above	2.098	0.885	4.972
Assisted of delivery			
Traditional birth attendant	1.00		
Modern birth attendant	0.829	0.502	1.371
Place of delivery			
At home	1.00		
Hospital	1.239	0.695	2.209
Mother’s age at giving birth			
15-20 years old	1.00		
20-34 years old	0.776	0.253	2.381
35-49 years old	1.007	0.317	3.203
Parity			
3-4 child	1.00		
1-2 child	0.823	0.532	1.271
Birth spacing			
Below 24	1.00		
24 and above	0.882	0.513	1.515
Early Pacifier:			
No	1.00		
Yes	2.081 *	1.075	4.028
Mother’s Socioeconomic			
Education			
No education	1.00		
Primary	1.670	0.754	3.703
Secondary and higher	2.577 *	1.046	6.353
Occupation			
At home	1.00		
Away	0.972	0.609	1.550
Economic level			
Low level	1.00		
Middle level	0.690	0.421	1.131
High level	0.503	0.251	1.009

Table 4.6 Multivariate logistic regression analysis of independent variables and infant ARI

Variables	Odds Ratio	95%Confidence Interval	
Mother's resident			
Urban	1.00		
Rural	1.333	0.712	2.496
Father's Factors			
Occupation:			
Agriculture	1.00		
Laborer	1.234	0.746	2.042
Professional	1.277	0.639	2.550
Education:			
No Education	1.00		
Primary	0.821	0.312	2.158
Second and higher	0.596	0.208	1.714
Environment factors			
Toilet Facility			
No toilet	1.00		
Yes	0.851	0.546	1.325
Number of children in a house:			
3 and above	1.00		
less than 3	0.457**	0.253	0.825
Floor			
Ground, bamboo	1.00		
Brick	1.039	0.586	1.842
Tile, ceramic	0.603	0.245	1.484
Safe water			
River, stream	1.00		
Protected well, pump	0.944	0.584	1.525
Piped	0.898	0.457	1.763
Type of Infant feeding			
Partial breastfeeding	1.00		
Exclusive breastfeeding	0.697	0.361	1.347
Infant Age			
0 – 2 months	1.00		
3 -5 months	3.508 **	1.669	7.373
6 -11 months	7.335	3.496	15.391

* Significant at p-value < 0.05
** Significant at p-value < 0.01

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The main objectives of this study are to explore the relationship between the different types of infant feeding and infant morbidity in Indonesia and to identify which population is more likely to give breastfeeding exclusively, partially or none to the babies. The data used in this study was taken from Indonesia Demography and Health Survey 1997. Populations of interest were 3,418 pair's mother's ages 15-49 years old and their infants aged 0-11 months.

It was found that the characteristics of mothers were associated to types of infant feeding. Mother's socioeconomic level including high education, high economic level and place of residence (living in urban areas) had associated to lower rate of exclusive breastfeeding. Mother's birth history including ANC (visits frequently), assisted delivery (modern birth attendant), place of delivery (hospitals), parity (1-2 children) and infant with pacifier had associated significantly with lower rate of exclusive breastfeeding. In terms of father's factors, father's education and father's profession had significantly relationship with a lower rate of exclusive breastfeeding. Background characteristics of population who are more likely to give exclusive, partial and non breastfeeding to the babies are infants with not pacifier and infant's age (0-2 months and 3-5 months).

Exclusive breastfeeding was significantly associated to infants younger than six months old in having diarrhea (two times) and ARI (almost two times) more than infants having partial breastfeeding and non breastfeeding. Moreover, among infants in the next 6 months exclusive breastfeeding, partial breastfeeding and non breastfeeding had no different in association with getting diarrhea and ARI. Exclusive breastfeeding and infant morbidity in multivariate analysis revealed that there were

insignificantly prevents infants from diarrhea and ARI. So, exclusive breastfeeding infants are less likely to have diarrhea and ARI compare to others group. The possible reason was that the analysis of types of infant feeding and infant morbidity were not specific examined in infant's age in the first six months and the second six months.

From the findings we can conclude that there is strong relationship between types of infant feeding and infants in having diarrhea and acute respiratory infection. However this study does not answer completely the objectives and research question of this study because the causality of types of infant feeding and infant morbidity was not supported significantly in multivariate analysis tested. However, since infants with exclusive breastfeeding have lower level of morbidity than infants who are partially breastfeeding and non breastfeeding, the hypothesis stated that infant who exclusively breastfed in suggesting period have associated with the lower rate of infants in having diarrhea and ARI are not rejected. And since non breastfeeding infants have lower level of morbidity than partial breastfeeding infants, the hypothesis stated that infants who do not breastfeed have higher level of infant morbidity than partial breastfed infant is rejected.

5.2 Recommendations

5.2.1 Policy Implications

According to the findings, the following recommendations are given:

5.2.1.1 Increase awareness of the importance of exclusive breastfeeding among health providers in clinics and hospitals and midwife in the villages by training regularly.

5.2.1.2 Increase knowledge of community about the importance of exclusive breastfeeding and appropriate way to feed the babies by campaign continuously.

5.2.1.3 Strengthen rooming-in concept in hospitals and clinics.

5.2.1.4 Limited sponsor by formulas and infants Foods Company in mothers and child activity also in health providers activity.

5.2.1.5 Create favorable environment in working place for mothers to breastfeed their babies.

5.2.1.6 Increase the environment sanitation standard by providing clean water, stimulate awareness of the community to provide healthy toilet, etc.

5.2.2 Further Studies

According to the limitation and findings of this study, further study is needed.

5.2.2.1. Biases will be minimized, with a proper designed of longitudinal or clinical study with combining to qualitative study to answer some questions, such as why never breastfeeding, what is the context of infant refused the food, as mentioned in Chapter 1 and 3.

5.2.2.2. To find the effect of exclusive breastfeeding to infant's health in suggested period needs to examine by infant's age 0-6 months. It should be separated of ages group were not suggested to exclusive breastfeed.

5.2.2.3. Beside infants age, it is needs considered to measure the effect of breastfeeding and birth weight, whether the baby got delivery complication or not, health status of the mothers, and the development of babies. So that the precise result will be found and clear illustration can be drawn about this topic.

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