



## Influence of socio-economic status on breastfeeding and cognitive development of a child in Kahawa west ward, Nairobi, Kenya

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### Abstract

The World Health Organization has recommended exclusive breastfeeding for the first 6 months of a child's life (WHO, 2003). Breastfeeding should continue to get breast milk together with other foods until they are two years old. The effects of breastfeeding during infancy have been a major point of inquiry among scientists. Scientists link breastfeeding to child cognitive, educational, mental, behavioral and psychomotor development (Kramer, 2008; Oddy, 2006). The literature was sourced using the relevant research articles from Psych Net, PubMed and Google Scholar among others. This paper assessed whether socio-economic status has any influence on breastfeeding and cognitive development of a child. The research design was *ex post facto* in which the children who were exclusively breastfed for the first six months of birth were compared with their counterparts who were formula fed. Cognitive assessment was done for both groups using Bayley's Screening test for infant development between 1-42 months. Total number of children was 180, (Females=93, males= 87). The results showed that there was no significant difference in cognitive development between the exclusively breastfed and the formula fed ( $M=1.444$ ,  $SD=0.5$ ) and ( $M=1.556$ ,  $SD=0.5$ ) respectively. ANOVA comparing the two groups was [ $F(1, 179) = 0.088$ ,  $p = 0.767$ ]. The research concludes that there is no difference in cognitive functioning of exclusively breastfed compared to the formula fed.

**Keywords:** cognitive development, low birth weight, exclusive breastfeeding, infants and toddlers and postnatal period

### 1. Introduction

The World Health Organization has recommended exclusive breastfeeding for the first 6 months of a child's life (WHO, 2003) [17, 18]. Breastfeeding should continue to get breast milk together with other foods until they are two years old (WHO, 2014) [19]. Despite these recommendations, the confounding factors continue to affect the likelihood initiating breastfeeding and limit the breastfeeding duration (Koren, 2013, Vohr 2005) [11]. The most significant confounders include socioeconomic factors which may have a bearing in the child cognitive development.

Health authorities consider optimal feeding for infants to be 6 months of exclusive breastfeeding then later followed by introducing appropriate complementary foods, at the same time continuing breastfeeding until toddlerhood. (National Health and Medical Research Council, 2003)

Breastfeeding has been associated with a range of benefits in the general population (Dell, 2001; Kramer *et al.*, 2008) [3]. Whether a child has been breastfed for 6 months or more, the duration of the breastfeeding has been seen to reduce the risk of early childhood respiratory tract infection such as asthma as well as diarrhea (Dell, 2001) [3]. There are positive associations between breastfeeding and health of mother, as well as the cognitive and motor development of children (Jonsdottir, 2012). Breastfeeding is also associated with reduced middle ear and urinary tract infections (Dyson *et al.*, 2006) [5]. A few studies show that breastfeeding can lead to

better motor development (Sacker *et al.*, 2006) [16]. Despite the growing research in this field, the mechanisms for these relationships are incomplete among scientists. It has been theorized that several components of breast milk—especially long-chained polyunsaturated fatty acids that accumulate in the retina and the brain- can affect the cognitive development because of their effects on neural development (Petryk *et al.*, 2007) [15].

There are several studies showing maternal socioeconomic status as a confounding factor of the association between breastfeeding and cognitive development. High rates of breastfeeding have been found in many low and middle-income countries (Li, 2008). The parental socioeconomic status, parental IQ, income levels can be used to examine the differences between cognitive development for homogenous breastfed and non-breastfed children (Koren, 2013) [11]. However, studies done in developed nations show greater heterogeneity between breastfed and non-breastfed population (Hunter, 1986) [10]. Thus, breastfeeding is closely associated with the socioeconomic status, maternal intelligence, income levels, and social advantage (Hunter, 1986, Moffitt, 1981) [10, 13]. These studies rule out biological effect between infant IQ and breastfeeding as such relationship would exist in multiple settings such as both the developing and developed world. Thus, IQ disparities are more apparent in socially advanced families because they have the choice to breastfeed.

The effects of breastfeeding during infancy have been a major

point of inquiry among scientists. Scientists link breastfeeding to child cognitive, educational, mental, behavioral and psychomotor development (Kramer, 2008; Oddy, 2006). Much of these studies have been a consequence of a century-old study by Hoefler and Hardy that found breastfed babies have better cognitive abilities than artificially fed children (Hoefler & Hardy, 1929) <sup>[8]</sup>. The association between child cognitive development and breastfeeding has conflicting results as many studies report mixed outcomes. While some research show a positive association (Geoff & Dreary, 2006) <sup>[7]</sup>, others found no relationship between the two variables. In their desk review of studies on breastfeeding and cognitive development, Geoff and Dreary (2006) <sup>[7]</sup> found that out of over 80 studies reviewed, the quality of positive and negative studies were even and so did not differ.

It is well documented that cognitive development in childhood is vital for an individual's capacity to learn and take advantage of the opportunities available within a particular environment (Angelsen, 2001) <sup>[2]</sup>. Individuals scoring higher on intelligence tests in early childhood are usually more successful in professional careers and achieve a higher level of education and better socioeconomic status, which may in turn positively affect their health status (Kimani-Murage, Madise & Fotso, 2011) <sup>[6]</sup>.

### 1.1 Significance of the study

The findings of the proposed study would contribute to the knowledge on the numerous health benefits for breastfeeding as well as helping the mother and child bond. Greater intensity could be added on the various studies done which have attempted to establish the impact of breastfeeding on cognitive ability by testing children of various ages. Through this research, Kamae, Soweto and Kiwanja slums may provide some insight on issues of exclusive breastfeeding in the slum dwellings.

## 2. Methodology

### 2.1 Research design

The study adopted a descriptive survey design where both qualitative and quantitative data were generated. Orodho (2009) <sup>[14]</sup> defines a survey as a method of collecting information by interviewing or administering a questionnaire to a sample of individuals. The study used an ex post facto, design which is suitable for a study that investigates the effect of some treatment administered to the subjects as compared to the control group. However most of the data was collected from the mothers and children mobilized by community health workers.

### 2.2 Target population, sampling design and data collection technique

The research population comprised mothers and babies clustered into two categories. The first group consisted of mothers of children who were exclusively breastfed for at least 6 months and the second were mothers with children who were not exclusively breastfed or formula fed. The age range was between 10 to 14 months. The mothers and their

Babies were from the catchment area of Kahawa west comprising the slums of Soweto, Kamae and Kiwanja. The mothers were able to communicate in either English or Kiswahili as captured by their standard of education in the questionnaire.

The sample comprised 180 babies aged 10-14 months. Since the research was interested in the first year of life, this age range gave an average age of 12 months. This included 100 babies who were exclusively breastfed for at least six months and another 80 babies who were either formula fed or not exclusively breastfed. This gave us 90 % response rate. The sample size was arrived at after considering the design and scope of the study. Data was generated while interviewing the mothers and also administering the Bailey's screening test to their babies. A sample of 100 exclusively breastfed and 80 of those who were not exclusively breastfed was used.

### 2.3 Measurement and sampling techniques

We used the Bailey's scales of infant development (BSID) to assess the babies' cognitive development after the process of recruitment was over. We used purposive sampling method to obtain our sample population from the sampling frame. Purposive sampling is described as a random selection of sampling units within the segment of the population with the most information on the characteristic of interest (Bernard 2002, Lewis & Shephard, 2006).

### 2.4 Research instruments; questionnaire

The research instrument was a questionnaire (with open ended and close ended questions). It was administered to mothers in order to determine pattern of exclusive breastfeeding and formula feeding of the infants who were breastfed exclusively for six months and are between 10-14 months old.

### 2.5 Data analysis

The instrument generated both quantitative and qualitative data. The quantitative data was analyzed using the descriptive statistics, with the aid of SPSS version 20. That is, frequencies, means and standard deviation. To determine correlation, Pearson's coefficient of correlation method was used. The results were analyzed using frequency distribution tables. The BSID scores were analyzed using the BSID manual during the assessment. The abridged manual which covers the cognitive domain of children 1-42 months of age was used.

## 3. Findings

### 3.1 Age of the baby when introducing baby formula or natural foods. Age of the baby when introducing baby formula or natural foods.

Table 1 shows that 2.8% of the respondents introduced formula food to their children between 0-6 months while 11.7% of the respondents introduced formula food between 6-12 months and 85.6% introduced formula food or natural food above 1 year. This could suggest that most women in Kenya do introduce formula food or mixed feeding when their babies are more than 12 months old.

**Table 1:** Age of the Baby when Introducing Baby Formula/other foods

Age of the Baby when Introducing Baby Formula	Frequency	Percent
0-6 Months	5	2.8
6-12 Months	21	11.7
Above 1 Year	154	85.6
<b>Total</b>	<b>180</b>	<b>100</b>

### 3.2 Influence of socio-economic status on breastfeeding and cognitive development

The objective of the study was to determine whether socio-economic status is related to (a) breastfeeding and (b) cognitive development of a child. (However, the mothers of the children in the sample were from the same social economic status). As a result of this, it was not possible to measure how this influenced the breastfeeding and also cognitive development for lack of comparison group. as a positive relationship for both exclusively breastfed and formula or mixed feeding.

### 4. Conclusions

The study could not ascertain the relationship between socioeconomic status (SES) and cognitive development, and SES and breastfeeding because all the mothers in the study were from the same socioeconomic. (Lower socioeconomic status). This made it impossible to compare the results.

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