ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

Evaluating the association between duration of breastfeeding and fine motor development among children aged 20 to 24 months in Butajira, Ethiopia

By: Rediate Shiferaw(BSc)

A thesis submitted to the school of graduate studies of Addis Ababa University in partial fulfillment of the requirements for the degree of masters in public health nutrition

October, 2019

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Advisors: Mr. Robel Yirgu (MPH, BSc)

Mrs. Yalemwork Getnet (MPH, BSc)

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Approved by the board of examiners

Chairperson, Department Graduate Committee: _____

Signature _____ Date _____

Name of Advisor: _____

Signature _____ Date _____

Name of internal examiner: _____

Signature _____ Date _____

Name of external examiner: _____

Signature _____ Date _____

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Abbreviations

ARA	Arachidonic acid
DHA	Docosahexaenoic acid
EBF	Exclusive Breastfeeding
EDHS	Ethiopian Demographic and Health Survey
FMOH	Federal Ministry of Health
HDSS	Health and Demographic Surveillance site
HSDP	Ethiopian Health Sector Development Program
IYCF	Infant and Young Child Feeding
ORS	Oral Rehydration Solution
SNNPR	Nationalities and Peoples Regional State
WHO	World Health Organization

Abstract

Background: In child development, the first two years have critical importance. At this stage breast milk is an important source of nutrition but the breastfeeding practice is poor and it is decreasing. The effect of developmental delay is pronounced in developing countries due to limited access to other resources that complement breast milk for mental development. The roles of nutritional and environmental factors on child development need to be studied for possible intervention.

Objective: To assess the association between duration of breastfeeding and fine motor delay among children aged 20 to 24 months living in Butajira, southern Ethiopia.

Method: This study was conducted among 20 to 24 months old children employing community-based case-control study design. Cases and controls were identified by conducting screening among children from 20 to 24 months living in Butajira. Fine motor was assessed using Denver developmental screening test. Independent variables were assessed using interviewer-administered questionnaire. Data were entered on to Epi-data version 4.4.2.1 computer software and exported into STATA version 14 for data cleaning and analysis. Descriptive statistics was determined and binary logistic regression was used for the association. Variables with p-value <0.2 on bivariable test and variables that have important clinical significance were added to multivariable logistic regression model and checked for significant association, which was declared at a 95% confidence level.

Result: The study has a sample size of 332 with 83 cases and 249 controls of children aged 20 to 24 months. We didn't find significant protective effect of breastfeeding for fine motor delay for children who were breastfed from 18 to 20 months [AOR: 0.42, 95% CI :(0.12, 1.42)] and for children who were breastfed from 21 to 24 months [AOR: 0.77, 95% CI :(0.33, 1.81)] compared to breastfed less than 18 months. Children who were stunted were 2 times more likely to have fine motor delay than children who were not [AOR: 2.04, 95% CI :(1.11, 3.74)]. Females were 2 times more likely to have fine motor delay than males [AOR: 2.15, 95% CI :(1.18, 3.89)]. Children who had mothers in the primary school were 71% less likely [AOR: 0.12, 95% CI :(0.14, 0.70)] and children who had mothers in the secondary school were 80% less likely [AOR: 0.20, 95% CI: (0.06, 0.70)] to have fine motor delay than mothers who didn't have formal education.

Conclusion: Duration of breastfeeding was not associated with fine motor delay for children aged 20 to 24 months old. Stunting, being a female and educational status of the mother were identified to have significant association with fine motor delay. Malnutrition should be prevented and all children should get access to adequate care and nutrition.

1. Introduction

1.1 Background

"Early child development encompasses a wide array of processes that take place from conception to the age of 5. It takes place in conjunction with growth and refers to the maturation of the function of acquiring skills, behavior and values, and adaptation with the environment" (1). Mental development is an important aspect of a person's life and helps to live and function productively and healthily. Developmental assessment is the process of mapping a child's performance compared with children of a similar age. Growth and development of the brain and central nervous system are often termed psychomotor development and are usually divided into four main domains: these are Gross and fine motor skills, Speech and Language, Social and personal activities of daily living Performance and cognition (2).

Motor development is the development of the child's bones, muscles and ability to move around and manipulate their environment (3). Motor skill is helpful to increase developmental capacity by allowing movement and creating opportunities to learn about their environment. "Fine motor skill is the ability to control movement through activities coordination of nervous system, fibril, and muscles such as fingers and hands." Fine motor is also seen as an important factor in the development of cognitive skills in childhood (4).

Child development is a dynamic process that is a result of the interaction between biological and environmental factors that play a role in the development of the child. Biological factors are genes, brain growth, neuromuscular maturation and Environmental influences include parent-child relationships, maternal characteristics, nutritional factors, community characteristics, cultural norms and factors in the environment that can influence the child (5). Nutritional factors such as malnutrition, nutritional deficiencies and low birth weight can affect a child's development (6).

Development is a combination of all these factors but the centrality of good nutrition cannot be ignored by providing the important building blocks for development (5). The main source of important nutrients for children at this age is breast milk. Breastfeeding has been identified by the World Health Organization as an ideal source that contains important nutrients that can help for the optimal growth and development of children. WHO recommends infants to exclusively

breastfeed for the first 6 months and continue to breastfeed up to 2 years with additional complementary foods (7).

Breastfeeding has many advantages for both the infant and the mother. It can help the child to have adequate nutrition immunologic function developmental function psychological and socioeconomic benefits for both the infant and the mother (8).

Breast milk contains carbohydrates, protein, fat, vitamins, minerals, digestive enzymes which help for proper growth and development of children. Especially fatty acids Docosahexaenoic acid and Arachidonic acid in breast milk are important for brain growth and development and the formation of important synapse or connection in the brain. Malnutrition and inadequate stimulation have been identified as a major risk factor for developmental delay (5). In low-income and middle-income countries, only 37% of children younger than 6 months of age are exclusively breastfed (9).

The effect of the environment is pronounced in areas with limited access to the requirements for development. If there is poverty, the environment can affect the proper growth and development by limiting care such as poor stimulating environments and poor nutrition that can limit growth and development (10). Therefore, studies need to be done on the effect of breastfeeding, nutrition and environmental influences on the developmental potential of the children.

1.2 Statement of the problem

Globally 5% to 15% of the pediatric population are said to be affected by developmental delay(11). The total number of children under five children affected by developmental delay is about 56 million, from this 95% of children are living in low and middle-income countries (12). The proportion of under 5 children not attaining their developmental potential due to extreme poverty and stunting is about 43% (10).

The first 2 years can predict the quality of life a child can have. Appropriate connections are formed and wired in this window if this stage is passed then it is hard to rewire the brain connections (13). Even though this age is critical children at this age are neglected (14). Motor development is also seen as an indicator of global child development. Not only a child needs to develop fine motor to do certain activities such as eating, handwriting but fine development is very important for the development of gross motor skills. Researches have also shown that fine motor development is connected with how a child performs later on other cognitive tasks and reading and solving mathemcal problems (15).

Early delay may increase the risk of subsequent cognitive-behavioral or academic problems. Studies have shown that Motor development can forecast language development (16). Speech and language delays are related to reading, writing attention and socialization. These delays can also predict language and Cognitive in school-aged children (17). Other studies have shown that early motor delay has been associated with autism later in life (18). Children with severe delays can be identified early but mild delays won't be recognized until school age and will not be able to receive early intervention (19).

A study done in Addis Ababa, Ethiopia have found a prevalence of fine motor delay of 38% and fine motor delay was the most prevalent delay than other developmental domains (20). Another study in Jimma has found that motor delay was the most affected delay among malnourished compared to non-malnourished children. Fine motor delay was ranked 2nd place next to gross motor at 2 years (21).

Adequate nutrition is important for proper growth and the important source of nutrients for children at this age is breastmilk. The nutrient contents in breastmilk especially DHA and ARA are very helpful for mental development (5). The practice of exclusive breastfeeding in Ethiopia is only 58% (22). Even though WHO recommends breastfeeding up to 2 years the practice in Ethiopia is decreasing. In 2011 EDHS report shows breastfeeding up to 2 years was 82% (23). In

the 2016 EDHS breastfeeding up to 2 years decreased to 76%. Also, in 2016 breastfeeding decreased from 91% at 12-17 months to 76% at 18-23 months (22).

Motor skills are also affected by other factors such as caregiving practice, stimulating environments (13). Especially in developing countries, the problem can be worse due to limited resources in the environment that can aggravate the problem. To our best knowledge there are limited studies regarding developmental delays and also the practice of assessing development in Ethiopia is low. Even though there are studies that have assessed the practice of duration of breastfeeding little research has been done concerning effects on the developmental milestones. Therefore, knowing the current situation and assessing the impact is helpful for early intervention to prevent adverse outcomes.

1.3 Significance of the study

The united nations have set sustainable developmental Goals to improve early child development by 2030. Goal 4 target 4.2 supplies that all children to get access to quality early childhood development and so they are ready for primary education (24). Therefore, working on child's early development is important for later outcomes. The study will help policymakers to know the breastfeeding and dietary practices, nutritional status of the children and can serve as a baseline to know the current situation on the impact of fine motor delay and will help to identify the gaps and for intervening on the identified gaps.

Since these delays will not be recognized by caregivers it will help as a reminder to the health providers on the importance of routinely examining developmental delays at any visit the child makes to health facility. It will also alarm health care providers on the need to give education to the community on the importance of providing proper care to the children.

2. Literature review

Determinants of fine motor delay

2.1 Nutrition related determinants

2.1.1 Duration of Breastfeeding

Breastfeeding is an ideal source of nutrients during the early years of their life. Exclusive breastfeeding up to 6 months and Continuing to breastfeed up to 2 years is recommended by WHO (7). In addition to other dietary sources that the child gets continuing to breastfeed is recommended because of important nutrients contained in breastmilk. The practice of continuing breastfeeding is also different in different countries. Developed countries have less practice of continuing breastfeeding than developing countries (9).

A study in USA also found increasing duration of breastfeeding from 3 to 6 months, 6 to 9 months and greater than 9 months and found that increasing duration protects fine delay by 51%, 33%, and 36% respectively (25). A study in done Greece and Taiwan studied breastfeeding greater than 6 months and found that any breastfeeding was associated with increase in motor development and each increase in duration of breastfeeding was associated with increase in the score for each development finding including fine motor development, which persisted even after controlling different confounders (26, 27). The study in Greece found that per accumulated month of breastfeeding 0.29 points increase in fine motor development. Also the study in Taiwan found that children who breastfeed more than 6 months had 36% lower odds of fine motor delay than children who were never breastfed at 2 years. Both studies found that development was highly associated with maternal education, income, maternal working status, and parity. The study in Taiwan showed that mothers who choose to breastfeed were older, had university education, did not smoke with high income and more likely to live in urban areas (27). A study in India also found a significant protective effect of duration of breastfeeding on fine motor development at 3 years (28). A study in Malawi assessed total energy intake from breast milk and total amount to breast milk the at 9-10 months and effect on motor development 12 to 18 also found a small but significant effect of breastfeeding on fine motor development, which persisted after controlling for educational, psychological and socioeconomic factors (29).

Contrary to these studies, a study in United Kingdom, infants who were breastfed greater than 4 months had 40% lower risk of having fine motor delay. The effect on fine motor delay becomes insignificant after controlling for biologic, socioeconomic and psychological factors (30). A study in Singapore studied the duration of breastfeeding as less than 1 month, 1-3 months, 3-6 months, 6-12 months and greater than 12 months, found duration of breastfeeding to have protective effect at 3 and 6 months but didn't find effect of breastfeeding on fine motor development at 24 months after controlling for socioeconomic status. And suggest that socio-economic status was a great predictor (31). Another study done in rural Brazil at 12 months didn't find effect of breastfeeding and suggested home stimulation and income were great influences. The study was done in rural community and suggested other factors than breastfeeding could affect the outcome (32).

These studies showed that maternal education and socio-economic status are great predictors. Studies from the developed countries have shown that mothers breastfeeding for longer durations were more educated and have a better income while in developing countries mothers who choose to breastfeed are from low socioeconomic status and are less educated (9). Other factors besides breastfeeding could affect the outcome. This inconsistency creates difficulties in interpreting the results in different settings. Therefore, more studies need to be done to confirm this result if the duration of breastfeeding can improve the developmental outcome in developing countries.

2.1.2 Dietary diversity

Minimum dietary diversity score is designed by the World Health Organization to assess the feeding practice of children from 6-23 months old (7). Child dietary diversity has been shown to have association with mean micronutrient adequacy of the diet. Having adequate dietary diversity is helpful to improve child growth and development. Important brain development occurs during the first 2 years and adequate nutrients supply at this age is very important (13).

Inadequate dietary intake can put children at high risk of undernourishment which can further impair their growth and development. Stunting in early life has been linked to delayed developmental capacity (33, 34).

Breastfeeding and dietary diversity are also interrelated. Studies have shown that children who consume adequate dietary diversity are also the ones that breastfeed for longer durations (35). While other studies have shown that having a dietary diversity may decrease breastfeeding because it is perceived by the mother that the child is getting adequate nutrient and may decrease

breastfeeding (36). While there are different factors that can affect the relation of breastfeeding and dietary diversity having adequate dietary diversity in addition to breastfeeding can be very important for growth and development of a child (37). Adequate dietary intake can also decrease child malnutrition and prevent children from having limited growth and development.

2.1.3 Malnutrition

The relationship between nutritional status and development cannot be seen separately especially, in developing countries where children are exposed to different harmful hazards.

Inadequate nutrition and limited care and stimulation which are found in resource-limited areas can limit the growth and developmental capacity of the children. This is due to lack of adequate nutrients for growth and development. This can affect physical growth and the structure of the brain which can affect neurodevelopmental potential (38). Children who are ill or small for their age may be less active and unable to explore their environment which will further hinder them from acquiring the developmental milestone they need to attain. Children who are malnourished will receive less environmental stimulation from their caregivers which will further aggravate the problem (38). A study done in Brazil, Tanzania and Jimma and has shown that malnutrition is a risk factor for decreasing score in developmental outcome of the children (39) (4) (38).

2.2 Socio-demographic characteristics

2.2.1 Socioeconomic status

Poverty is an important factor that can affect developmental potential. Children growing in poor environments are most venerable (13). A study in Greece and Taiwan concluded that increasing duration of breastfeeding improves fine motor development. In their study they have found that mothers who choose to breastfeed for longer duration had better socioeconomic status (26, 27). A study done in rural Brazil at 12 months in a poor community didn't find significant protective effect of increasing duration of breastfeeding and most of the study participants were form low socioeconomic status. They have found socioeconomic status to have influence on motor development (32). This is due to lack of nutrition, parental care, availability of resources that are associated with low socioeconomic status limiting the development of the children (5). The role socioeconomic status to improve home environment plays a significant role (40).

Studies in developed countries shown that mothers who breastfeed for longer durations have better socioeconomic status while studies in developing countries have shown that mothers who

breastfed for longer durations are from lower socioeconomic status (9). Results from developed countries cannot be reliable in developing countries and socioeconomic status need to be considered when interpreting results.

2.2.2 Maternal education

Maternal education is one of the important characteristics that can affect a child's developmental(41). Most studies done in developed countries have shown that mothers who choose to breastfeed longer and exclusively are more educated than mothers who choose not to breastfeed. While in developing countries mothers who choose to breastfeed longer had low educational status (9). And studies in developed countries that have found protective effect of breastfeeding on development have shown that mothers who choose to breastfeed for longer duration were more educated (25, 26). While studies in developing countries that didn't find association between breastfeeding and development have found that mothers who breastfed for longer duration were less educated (32). The protective effect of maternal education can be explained by different reasons. Mothers who are educated tend to create more stimulating environment that is suitable for development or mothers who are educated can have good income that can provide the important requirements for the child growth and development (42).

2.2.3 Maternal age

The age of the mother is an important factor for child development. Some studies have also found maternal age as predictor for fine motor development (27, 31). Studies have shown that as the age of the mother increases the duration of breastfeeding also increases. Older mothers breastfeed for longer durations than young mothers (43, 44).

A study in Australia found that children from older mothers scored better in fine motor development. Suggested that older mothers tend to create more conducive environments for child development and also breastfeed for longer durations (45). Contrary to this studies done in Canada found negative association with motor development. As the age of the mother increases the score on motor scores decreased (46). Studies that have found protective effect of breastfeeding suggested that the mothers who breastfeed longer were older, had high socioeconomic class and were educated and could possibly aid for development (26, 31). While interpreting the result in addition to age of the mother other maternal factors also need to be considered.

2.3 Child characteristics

2.3.1 Births order

Family size is also an important factor for child development. The larger and the less the interval between the children the less care they receive which can affect their development. Different studies have suggested different results on the birth order of children. The oldest and the youngest tend to have better development since care is given to them until there is another child in the family (47).

Mothers may not spend the same amount of care and investment in children with different birth orders. Some studies have shown that mothers are more likely to spend more time with their first born by reading and playing. And later-born children may have to share the resource and time from their mother. A study done in US also found that mothers tend to breastfeed their first child for longer duration than their 4^{th} or more. Mothers decrease their investment after their first born(48).

Contrary to this another study found that in developing country context later-born children are breastfeeding for longer durations. Firstborn babies are breastfed for shorter durations and will experience developmental delay (49). But there are also other justifications that having an older sibling is helpful for better development. Older babies tend to stimulate the young babies helping for young child's development. There are also studies that have found no effect of birth order on breastfeeding and further involvement of the mother (50).

2.3.2 Gender

Gender is an important factor that can affect the outcome of development. Studies have also shown that boys are more susceptible than girls to be affected at critical times possibly due to neuroprotective effect of estradiol that is found at high concentration in females. The components in breast milk that are important for neurodevelopment have more benefits for boys(1).

Breastfeeding duration can be determined by the mother's preference for the gender of the child. If the gender of the child is not the mother's preference, then mothers will stop breastfeeding early to have another child not to delay another pregnancy. A study in India has shown that Girls are breastfed for shorter durations than boy's mainely due to the gender preferences by the mother. Mothers will start early weaning for girls than boys (51). Studies have shown that girls score better on fine motor development than boys (52, 53). This could be due to boys are

interested in games that require movement and activity which are more related to gross motor and girls are more interesting games that are peaceful and symbolic which are related to fine motor (54).

2.4 Psychological factor

2.4 Maternal and child interaction

“Behavioral control is defined as the ability of the parent to regulate the behavior of the child by using discipline (providing rewards and punishments) and monitoring” (55). The role of the mother or the caregiver has a protective role even for children growing in limited environments such as low socioeconomic status, low levels of education, chronic illness, conflict and mental health problems of caregivers. Mothers' sensitivity is important because it creates conducive environment for the development of the child (56).

Breastfeeding is helpful to promote maternal and child interaction. Mothers who breastfed are less likely to be depressed and also breastfeeding promotes further maternal and child bonding. The release of hormones like oxytocin and vasopressin during breastfeeding increasing emotional bonding between mother and child and creates maternal sensitivity and care which can improve the child’s development and lower incidence of psychopathology and incidence of substance abuse(57). Motor development can be regulated critically by Home environment and maternal and child interaction (40). The longer the duration of breastfeeding the better mother-child interaction the better the outcome than non-breastfeeding (57). Mothers in African who choose to breastfeed longer are from low educational status. Mothers with good education had a better practice of creating better housing nutrition and stimulating environments than mothers with low educational status. Even though breastfeeding improves the mother and child interaction but development can also be affected by other factors in the environment (58).

2.3 Conceptual framework

The conceptual framework Adapted and modified from A Toolkit for Measuring Early Childhood Development in Low- and Middle-Income Countries Lia C. H. Fernald, 2017 (13).

The conceptual framework shows the role of environmental and biological factors in child development. Environmental factors such as demographic factors: - age of the mother, educational of the mother and socioeconomic status and biological factors such as child characteristics as distal factors that can affect the proximal factors, nutrition and responsive care giving. The proximal factors will affect the outcome, fine motor development.

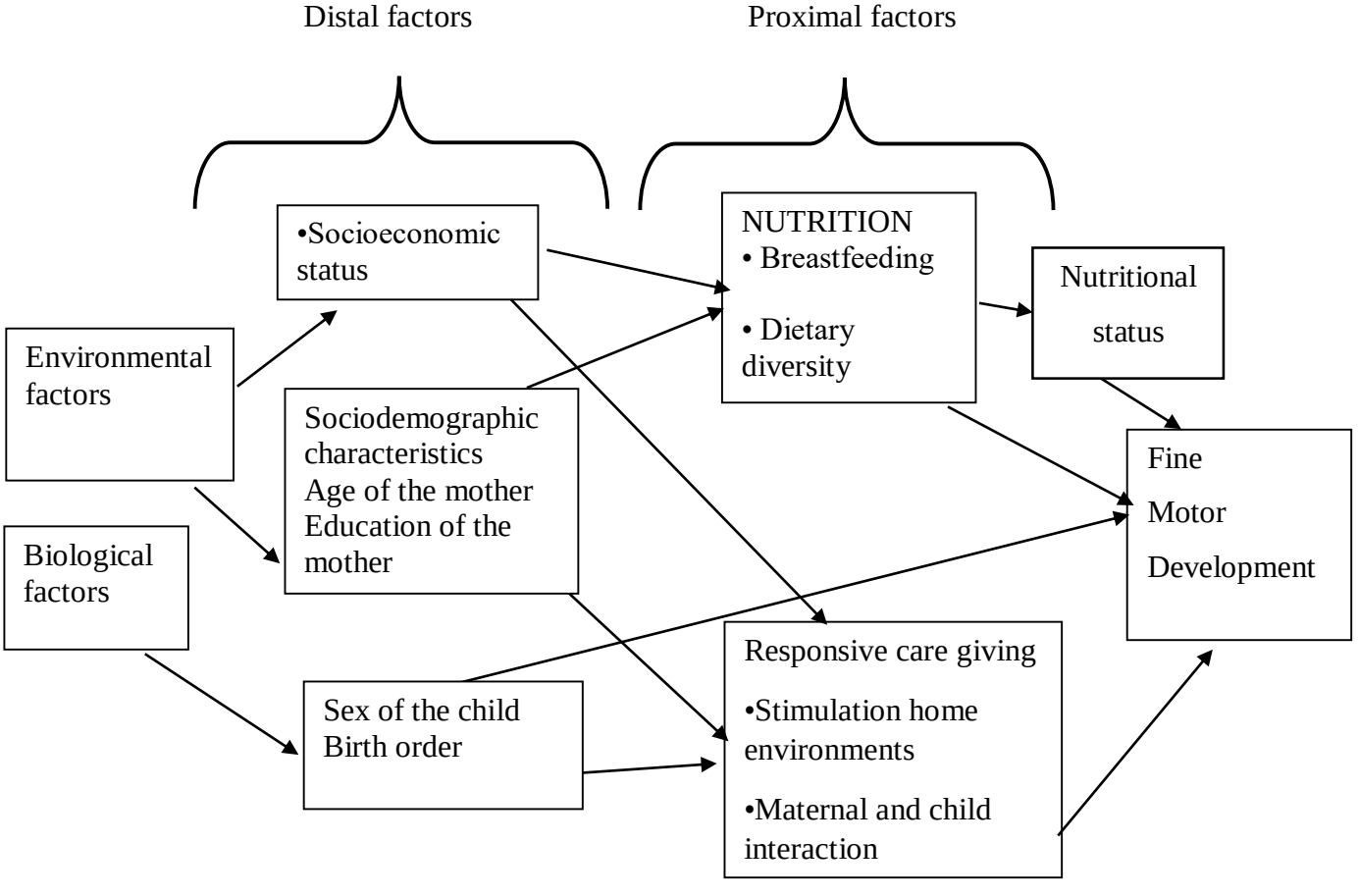


Figure 1: Conceptual framework on the role of context, environment, and caregiving in child development.

3. Research question

Is the duration of breastfeeding associated with fine motor delay?

Hypothesis

HA= Duration of Breastfeeding is associated with fine motor delay.

4. Objective

3.1. General objective

- To measure the association between duration of breastfeeding and fine motor development among children aged 20 to 24 months in the Butajira Health and Demographic Surveillance site (HDSS).

5. Methods and material

5.1. Study Area

The study was conducted in the Butajira Health and demographic surveillance site located in Southern Nations and Nationalities (SNNP), Ethiopia. The area is located 130 km south of Addis Ababa and 50 km to the west of Zeway town in the Rift Valley, 8.2o north latitude and 38.5 o east longitude. The climate varies from arid dry lowland areas at altitudes around 1,500 m (tropical climate) to cool mountainous areas up to 3,500m above mean sea level (temperate climate). The main wet season occurs between June and October, with the remaining months predominantly dry. Day-time temperatures are typically between 20-30 0C with night-time temperatures falling close to freezing at higher altitudes.

The Butajira DSS was established in 1986 with the main objective of generating continuous and valid data on vital statistics. The HDSS site has 10 kebeles under supervision, 9 rural and 1 urban kebeles which was selected based on probability proportionate to size technique. Since 1987 all households in a defined geographical area have been visited every three months in order to document births, deaths, and migration (59).

In 2007, the total population of Butajira Town was 33,333 with 1:1.03 male to female ratio. In 2019 the population of children in the HDSS from 20 to 24 months was 602. In 2014 prevalence of malnutrition among children at 1 year was (21.2%) underweight, (48.1%) stunted and (8.4 %) were wasted (60). The livelihood of the residents is based on mixed farming. Khat (Catha edulis Forsk) and chili-peppers are the main cash crops, while maize and “false banana” or Ensete (Ensete ventricosun) are the main staples (59).

5.2. Study Period

The study was conducted from March 2019 to May 2019.

5.3. Study design

Community based unmatched case-control study was conducted among children aged 20 to 24 months.

5.4. Population

5.4.1 Source population

All children from 20 to 24 months living in Butajira HDSS

5.4.2 Study population

Children from 20 to 24 months living in Butajira HDSS that has been identified as cases and controls based on the Denver developmental screening test.

Case definition

Cases were children who were identified as being suspect for fine motor delay and controls were children without fine motor delay.

Case (Suspect): Two or more caution (Item on which the age line fails or between the 75th and 90th percentile). This means 75 percent of the children can pass the test below the child's age, and /or

One or more delay (a child fails to perform an activity that fail completely to the left of the age line) using the Denver developmental screening test. It is considered that a child fails to perform an item that 90 percent of children can perform at an earlier age.

Control (Normal): No delay and a maximum of one caution using the Denver developmental screening test.

5.4.3 Study unit

Children available during the time of data collection and from whom information was collected in Butajira HDSS.

5.4. 4 Inclusion criteria

All children living in Butajira HDSS from 20 to 24 months were included in the study with caregivers available during the study period were included in the study.

5.4.5 Exclusion criteria

Children who had acute illness and who had physical disabilities (physical impairments) that would affect their performance on the assessment on developmental screening were excluded from the study. This is because children with disability might fail the test due to their disability and not due to the developmental problem.

5.5 Sample size calculation

Sample size was calculated using EPI INFO 7 software using unmatched case-control study at 95% confidence interval and 80% power and using r=3(ratio of cases to controls) From a previous study done in Taiwan (27) (Table 1)

Table 1: Sample size calculation for association between duration of breastfeeding and fine motor delay.

Variable considered	Assumption Previous studies proportion /OR	CI	Margin of error	Power	Sample size	Ratio cases to controls(1:3)
Breastfeeding duration	Proportion of Controls among those who breastfeed <6 months P = 89.97%	1.96	5%	80%	328	Cases 82
	Proportion of Cases among those who breastfeed <6 months P =76.4%					Controls 246
	OR=0.36					

By adding 10% non-response rate with Ratio of 1:3, the sample size becomes 360 with 271 controls and 90 cases.

5.6 Sampling procedure

A survey (screening) was conducted from March to May 2019 in Butajira HDSS. Participants were all children from 20 to 24 months living in the Butajira HDSS. The total population of children in Butajira HDSS from 20 to 24 months was 453. The location and number of children and the sampling frame were obtained from the HDSS.

After going into each Keble and household 376 children that were available were assessed using Denver developmental screening test and identified as cases and controls. We found 85 cases and 291 controls. Then after identifying the households with cases and controls a repeated visit on

the same household and on the same child was done to gather the rest of the information. After visiting the households 332 samples 79 cases and 253 controls were available and were assessed using interviewer-administered questioners and measurements were taken.

Sampling procedure

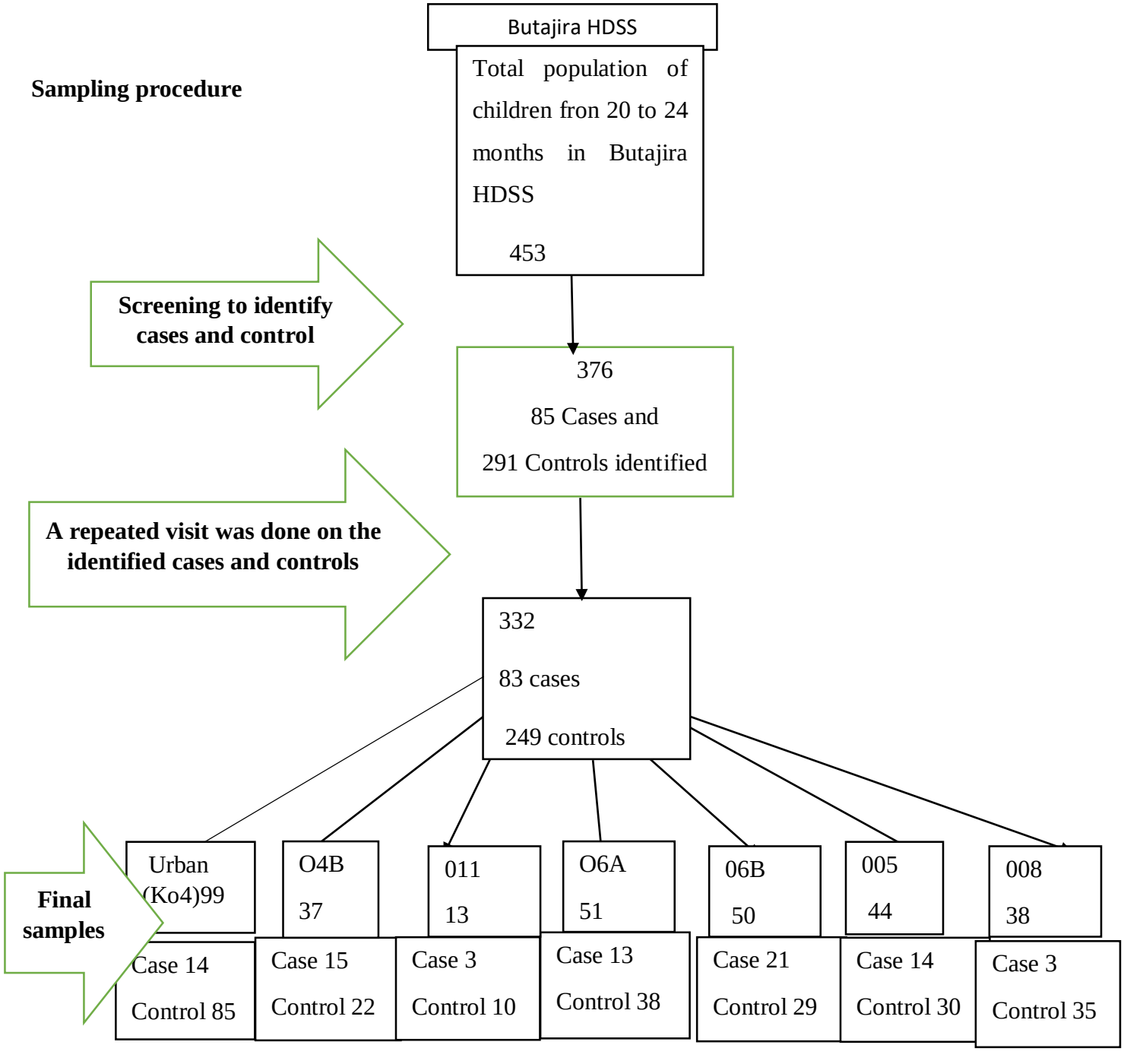


Figure 2: Schematic presentation of Sampling procedure among children from 20 to 24 month living in Butajira, Ethiopia 2019

5.7 Study Variables

5.7.1 Dependent variable

- Fine motor delay

5.7.2 Independent variables

- **Nutritional factors**; Breastfeeding duration, Dietary habit of the infant, Nutritional status
- **Child characteristics**: sex of the child, birth order
- **Socio-demographic variables**: age of mother, occupation of mother, education status of mother, socioeconomic status
- **Caregiving practice**: Home environment

5.8 Operational definition

Caregiver (caretaker): a parent or an adult that is responsible for daily care and raring of the child

Breastfeeding less than 18 months: mothers while in the data collection report that they have breastfeed their babies less than 18 months.

Continue to breastfeed 18 to 20 months: mothers while in the data collection report that they have breastfeed their babies from 18 to 20 months and stopped.

Continue to breastfeed 21 to 24 months: mothers while in the data collection report that they have breastfeed their babies from 21 to 24 months.

Fine Motor development

Normal: no delay and a maximum of one caution

Caution items are interpreted when a child fails or refuses an item on which the age line fails or between the 75^{th} and 90^{th} percentile. This means 75 percent of the children can pass the test below the child's age

Delays are considered when a child fails to perform an activity that fail completely to the left of the age line. (not on the item that the age line passes) It is considered that a child fails to perform an item that 90 percent of children can perform at an earlier age.

This means 75 percent of the children can pass the test below the child's age. When a child passes, fails, or refuses an item that is between the 25^{th} and 75^{th} percentile it is considered normal

Suspect: Two or more caution and /or one or more delay.

Caution items are interpreted when a child fails or refuses an item on which the age line fails or between the 75^{th} and 90^{th} percentile. This means 75 percent of the children can pass the test below the child's age (61).

Adequate Dietary diversity: Children who receive foods from 4 or more food groups using 24-hour recall (7).

In adequate Dietary diversity: Children who received foods less than four groups using 24-hour recall (7).

Nutritional status: Children were classified based on z-scores of the World Health Organization.

Wasting: weight-for-length (WLZ), Children were classified as wasted, if they score< -2 standard deviation (SD) (62).

Underweight: weight-for-age (WAZ), Children were classified as, underweight, if they score< -2 standard deviation (SD) (62).

Stunting: length-for-age(LAZ), Children were classified as stunted if they score< -2 standard deviation (SD) (62).

4.10 Data collection tool/instrument

The fine motor was assessed using Denver II developmental screening test. The tool contains different materials that help to examine the development of the child and a test form that contain all the developmental domains in sections. It was designed to test developmental problems in young children. It can be used to test development of children from birth up to 6 years. It can assess four developmental areas gross and fine motor, language, socio-emotional and personal-social. It does not measure IQ or it's not a diagnostic tool but can help as a first-line screening tool to help identify children with suspected developmental delays (61).

The Denver II tool was adapted in Jimma into a developing country context and was validated in Butajira Ethiopia (63, 64).

Motor development was assessed from20 to 24 months. This age group is selected based on the recommendation by the American Academy of Pediatrics. Approves using 24 months to identify developmental delay and helps us to evaluate the WHO recommendation to breastfeed up to 2 years (20, 65).

Data on sociodemographic and breastfeeding histories were collected using interviewer-administered questions.

Total Breastfeeding duration was assessed using interview administered questioners form study that assed breastfeeding duration since birth (66).

Complimentary food was assessed using WHO dietary diversity (7).

Frequency of breastfeeding was asked using questioners used in previous studies (67).

Interview using Questioner that assesses personal information about the parents Father and mother, sociodemographic characteristics.

The home environment was assessed using home inventory used in different studies (68).

An electronic weighing scale with a sensitivity of 10 g was used for recording the weight.

Infant meter was used to measure the length of the infants.

5.9 Data collection procedure

The data collection started by Screening for a suspect for fine motor development. The study was conducted by 5 data collectors and 2 supervisors. The supervisors were working in the Butajira HDSS and who were familiar with the area and with field experience and had higher education qualifications. The outcome variable fine motor was assessed with 1 data collector who had BSC in nursing and was also certified for assessing the children using Denver developmental screening test. The Four data collectors participated in assessing the exposure variables with interviewer-administered questioners and anthropometric measurements.

Breastfeeding duration was assessed using interviewer-administered questionnaire. It was taken by asking the mother to recall the total duration she breastfed her child. Whether she is still breastfeeding or to recall the time she stopped breastfeeding her child. Also if the mother reported she was currently breastfeeding she was asked how often she usually breastfeeds her child.

Dietary diversity was collected using dietary diversity scores adapted from WHO standardized questioner for infant and young child feeding (IYCF). Mothers or caregivers were asked to recall all the food items that the child consumed during the past 24 hours (7).

The home score was assessed by interview administered questioners. It was done by giving the mother a picture book and the mother will show the picture book to the child. Observation will be made on the interaction and the response the mother has towards her child. The interview was conducted in a free, and friendly environment. The observation was made on the maternal and child interaction maternal responses towards the child while asking other questions form the home inventory.

Anthropometric measurements were taken at the end of each interview. Weight and length of all infants were recorded using standard procedures by trained data collectors. Weight was measured using digital scale and length was measured using length board. Since the children are under 2 years they were measured with the caretaker and the caretaker was measured alone and the difference of the two was taken as the weight of the child. The measurement was rounded to the nearest 0.1kg and 0.1cms, for the weight and length measurements respectively. Calibration was done to measure the accuracy of the measuring materials.

Fine motor development was assessed by the Denver developmental screening test which is designed to test the development of the child. The test was conducted using Denver II chart. The test was done in natural and comfortable environment where the child can play with minimal disturbance in the presence of the caretaker. The test was started by informing the mother that the child is not expected to pass all the items.

The scoring has 4 items

“P” for pass – the child successfully performs the item or the caregiver reports (when appropriate) that the child does the item

“F” for fail- the child does not successfully perform the item, or the caregiver reports (when appropriate) the child does not do the item

“N.O” for no opportunity- the child has not had the opportunity to perform the item, due to restrictions from the caregiver or other reasons. This score may only be used to report items, are not used in interpretation of the entire test.

"R" for refusal- the child refuses to attempt the item. Refusal can be minimized by telling the child what to do rather than asking. If given instruction in proper administration, the caregiver may administer the item. Report items cannot be scored as refusals.

After carefully identifying the child's age draw the age line using the age scales draw an age line from the top to the bottom of the form. Age scales are placed at the top and bottom of the page. Spaces between the age marks represent 1 month until 24 months. Draw the exact age without rounding off days, weeks, or months.

After drawing the age line the child was asked to perform an activity to the left of the age line, this was done until the child was able to pass three or more constative items that intersects below the age line. Also, the child was tested for items that intersect above the age line until the child failed three or more constative items.

For each item, there are 25^{th}, 50^{th}, 75^{th} and 90^{th} percentile.

A child can pass-fail or refuse an item based on an item on which the age line fells on.

By then identifying the child's outcome and using all the scores that the child has and finding the results will be cared out.

Normal: no delay (the child successfully performs the action) and a minimum of one caution (between the 75^{th} or 90^{th} percentile)

Suspect: two or more caution and/or one or more delay (the child fails to perform an activity that fails completely to the left of the age line.)

Untestable: refusal scores on one or more items completely to the left of the age line or one more than one item intersected by the age line in the 75%-90% area.

Praise the child even for items that are failed. This will build the confidence of the child to attempt more difficult items (61).

5.11 Data quality management

Pretesting of the questionnaire was done in the community on 19(5%) of the mothers in the community. Data collectors were trained for 4 days on each measurement, keeping the confidentiality of the participants and on making sure on the beneficence of the participants by providing helpful information.

The Denver developmental screening test was validated in Butajira Ethiopia which is helpful because it was validated in similar settings with our study.

To decrease the researcher bias data collectors that had assessed outcome variables and exposure variables were different. The data collectors that assessed the exposure variable did not have any information about the developmental status of the child.

Intra & inter-observer TEM was also be calculated. The Intra observer TEM was between 0.001-0.002 for length and was between 0.1-0.14 for weight measurements. On the other hand, the inter-observer TEM was 0.005 for length and 0.17 for weight. In all cases the calculated TEM was within the acceptable range (69).

Data were checked for completeness inconsistencies, handwritings, at the end of each day by field supervisor and incompleteness was discarded and was refilled the next day. ID number was given to each individual infant. Data were coded and entered into Epi-data version 4.4.2.1 software.

5.12 Data processing and analysis

Data were checked manually for completeness and entered onto Epi-data version 4.2.2.1 statistical software and exported into STATA version 14 for data cleaning and analysis.

The data were analyzed using descriptive statistics and using bivariable and multivariable logistic regression to check for significant association and for controlling confounders.

Frequencies and summary statistics (median, interquartile range, percentage, and range) were used to describe the study population in relation to relevant variables.

Nutrition related variables such as duration of breastfeeding was categorized based on the duration of breastfeeding in months and was grouped as breastfed less than 18 months, 18 to 20 months and 21 to 24 months. Dietary diversity was also assessed using Minimum dietary diversity score comparing children who had consumed four or more food groups and for children who scored less than four groups using 24-hour recall.

For analyzing nutritional status nutritional data were exported to WHO anthro software. Weight-for-length (WLZ) and Weight-for-age (WAZ) was categorized based on z-scores of the World Health Organization. Children were classified as wasted, underweight, and stunted if they score < -2 standard deviation (SD).

Socioeconomic status was analyzed based on wealth index by using Principal component analysis (PCA). This was used first by asking the household assets and housing condition of the participants and by giving a score of 1 to those that have and 0 to those that did not own the assets. Then PCA explaining most of the variation was taken as a wealth score. Wealth index was ranked by rank order in to quintiles to give poorest, poor, medium, wealthy and wealthiest status.

Childcare practices, maternal-child interaction were checked using Home score.

Binary logistic regression was used to check for the association between the dependent, fine motor delay and independent variables such as sociodemographic variables maternal age, maternal occupation, education status of mother, socioeconomic status, husband education status, family size and child characteristics birth order and sex of the child. Variables with P- value <0.2 and which had clinical importance or subject matter were included in the multiple logistic regression (70). In the multiple logistic regression, Variables with 95% CI of AOR which did not include 1 were considered to have significant association with the outcome variables.

The home score, wasting and underweight and frequency of breastfeeding was removed from the multiple logistic regression due to multi collinearity with VIF >10.

5.13 Ethical considerations

Before data collection ethical clearance was obtained from Addis Ababa University School of public health Ethical clearance committee. The willingness of the participants to participate in the study was ensured. The confidentiality of the information of the participants was not disclosed. Well trained data collectors were included in the study to ensure the safety of the children. It was explained to the parents that the scale determines the child's current developmental status it's not an IQ test and the child is not expected to pass all the tests administered. The beneficence of the participants was assured by providing education to the participants on benefits of breastfeeding growth and development. Children identified with developmental delay were given further education on improving the motor skill of the child.

5.14 Dissemination of the results

Primarily, the findings of the study will be submitted to School of Public Health College of Health Science Addis Ababa University. Then the findings will be communicated to the regional health bureau and FMOH by sending a copy of the research. An attempt will be made to publish on national and international journals to communicate the finding.

6. Results

A total sample size of 332 children with 83 cases and 249 controls aged 20 to 24 months living in Butajira HDSS participated in the study. The study had a response rate of 91.2% for both cases and controls.

6.1 Socio demographic characteristics of the study participants

Mothers in the age group from 25-29 years were 35(42.17%) in the cases while 101(40.56%) were in the controls. The median age of the mothers was 28, IQR (25 33%). About 48(57.83%) of mothers in the cases and 93(37.65%) of mothers in the controls didn't have any formal education. 58(69.88%) from the cases and 185(74.60%) of mothers from the controls were Housewives. About 39(46.99%) fathers in the cases and 67(26.91%) in the controls didn't have any formal education. About 23(27.71%) in the cases and 52(20.88%) in the controls were from the lowest quantile. About 69(83.13%) from the cases and 179(71.89%) from the controls were Rural residents. The home score had a minimum score of 13 and a maximum score of 32. (Table 2)

Table 2: Socio-demographic characteristics of the participants in Butajira, Ethiopia, 2019

Characteristics	**Fine motor delay**	
Sociodemographic characteristics	**Cases (n, %) n=83**	**Controls (n, %) n=249**
Maternal age at birth		
18-24	21(25.30)	61(24.50)
25-29	35(42.17)	101(40.56)
30-34	22(26.51)	64(25.70)
35 and above	5(6.02)	23(9.24)
Mothers education		
No formal education	48(57.83)	93(37.65)
Primary school(1-9)	29(34.94)	108(43.72)
Secondary school(9-12) and above	6(7.23)	46(18.62)

Maternal occupation		
Housewife	58(69.88)	185(74.60)
Merchant	24(28.92)	53(21.37)
Government employee	1(1.20)	10(4.03)
Marital status		
Married	80(96.39)	241(96.79)
Divorced	1 (1.20)	2 (0.80)
Widowed	2(2.41)	6(2.41)
Fathers education		
No formal education	39(46.99)	67(26.91)
Primary school(1-9)	33(39.76)	118(47.39)
Secondary school(9-12) and above	11(13.25)	64(25.70)
Area of residence		
Urban	14(16.87)	70(28.11)
Rural	69(83.13)	179(71.89)
Socioeconomic status (Wealth index in quintile)		
Lower	23(27.71)	52(20.88)
Second	17(20.48)	58(23.29)
Middle	19(22.89)	60(24.10)
Fourth	15(18.07)	38(15.26)
Higher	9(10.84)	41(16.47)

6.2 Child-related characteristics

The study included 168 males and 164 female children from the age group of 20-24 months. The median age was 24 months and the 1QR was (22 25%). About 36(43.37%) males were cases while 132(53.01%) were in the controls. (Table 3)

Table 3: Child-related characteristics of the participants in Butajira, Ethiopia, 2019

Characteristics	**Fine motor delay**	
Child characteristics	**Cases (n, %) n=83**	**Controls (n, %) n=249**
Sex of the child		
Male	36(43.37)	132(53.01)
Female	47(56.63)	117(46.99)
First	14(16.87)	47(18.88)
second	8(9.64)	54(21.69)
Third	23(27.71)	43(17.27)
>=4	38(45.78%)	105(42.17)
Relation with the child		
Mother	81(97.59)	243 (97.59)
Caregiver	2(2.41)	6 (2.41)

6.3 Delivery and Nutritional characteristics of the study participants

Health facility delivery among the cases was 67(80.72%) and 213(85.54%) among the controls. Breastfeeding at least once was 81(97.59%) among the cases and 248(99.60%) among the controls. 49(59.04%) mothers in the cases and 139(55.82%) in the controls reported that they are currently breastfeeding. (Table 4)

Table 4: Delivery and Nutritional characteristics of the participants in Butajira, Ethiopia, 2019

Characteristics	Fine motor delay		Chi2 (P-value)
Sociodemographic characteristics	**Cases (n, %) n=83**	**Controls (n, %) n=249**	
Place of birth			
Home	16(19.28)	36(14.46)	0.446
Health facility	67(80.72)	213(85.54)	
Mode of delivery			
Spontaneous vaginal delivery	78(93.98)	239(95.98)	0.861
Instrumental delivery	5(6.02)	10(4.02)	
Ever breastfeed			
Yes	81(97.59)	248(99.60)	0.155
No	2(2.41)	1(0.4)	
Fed colostrum			
Yes	78(93.98)	245(98.39)	0.047
No	5(6.02	4(1.61)	
Time of Initiation of breastfeeding			0.14
Immediately less than an hour	75(90.36)	243(97.98)	
Between 1 and 23 hour	5(6.02)	4(1.61)	
More than 24 hours	3(3.61)	1(0.40)	
Currently breastfeeding (From 20 to 24 months)			
Yes	49(59.04)	139(55.82)	0.609
No	43(40.96)	110(44.18)	
Frequency of breastfeeding			
Only at night	2(4.08)	2(1.44)	0.372
2 to 3 times during the day	7(14.29)	12(8.63)	

3 to 5 times during the day	22(44.90)	59(42.45)
6 times and more	18(36.73)	66(47.48)

About 66(79.52%) children in the cases and 177(71.08%) children in the controls continued to be breastfed from 21 to 24 months. (Figure 4)

There was no significant variation among cases and controls by the duration of breastfeeding 95% CI (p=0.234)

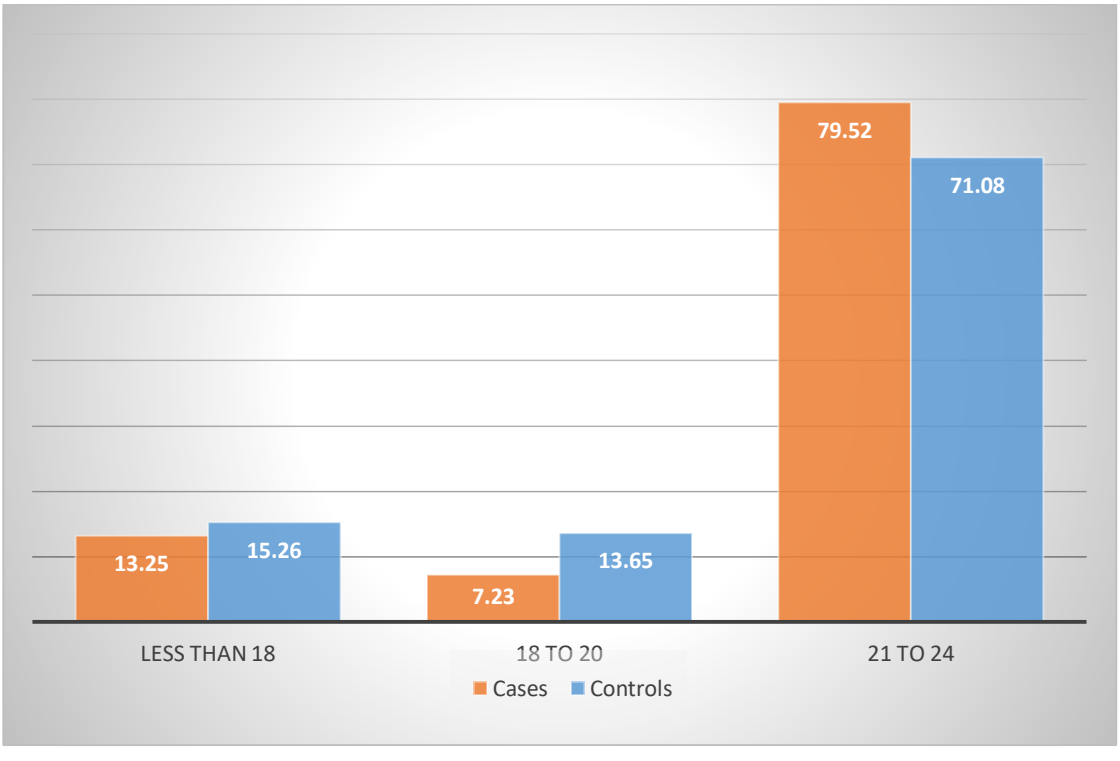


Figure 3: percentage of duration of breastfeeding by comparing cases and controls in Butajira, Ethiopia 2019

6.4 Dietary practices and nutritional characteristics of the children

About 46(55.42%) of children in the cases and 179(71.89%) in the controls started solid or semi-solid food within 6 to 8 months. About 32(38.55%) of the cases and 183(73.49%) in the controls were stunted. There was difference among cases and controls on children who were stunted and by the time of starting of solids and semisolid foods. (Table 5)

Table 5: Dietary practices and nutritional characteristics of the children aged 20 to 24 months in Butajira, Ethiopia. 2019.

Characteristics	**Fine motor delay**		**Chi2(P-value)**
	Cases (n, %) n=83	**Controls (n, %) n=249**	
Age of starting of solid and semi-solid foods			
>5 month	10(12.05)	21(8.43)	**0.039**
6-8 month	46(55.42)	179(71.89)	
9-12month	15(18.07)	32(12.85)	
>12 month	12(14.46)	17(6.83)	
Dietary diversity			
Inadequate diet	76(91.57)	231(92.77)	0.788
Adequate	7(8.43)	18(7.23)	
Nutritional status			
Wasting			
wasted	8(9.64)	17(6.83)	0.318
Normal	75(90.36)	232(93.17)	
Underweight			
Underweight	10(12.05)	22(8.84)	0.299
Normal	73(87.95)	227(91.16)	
Stunting			
stunted	32(38.55)	66(26.51)	0.021
Normal	51(61.45)	183(73.49)	

6.5 Association of different Characteristics of children with suspect for fine motor delay.

In the binary logistic regression variables with p value <0.2 or factors that had clinical importance were identified. From Child characteristics sex of the child and birth order of the child, from socio demographic characteristics age and education of the mother, wealth index and from nutritional factors duration of breastfeeding, dietary diversity, age of starting solid foods and nutritional status, delivery practices mode of delivery and place of birth were taken in to the multivariable model (Table 6).

After adjusting for these variables stunting, sex of the child and the educational status of the mother were identified to have significant association with fine motor delay.

We didn't find significant protective effect of breastfeeding for fine motor delay for children who were breastfed from 18 to 20 months [AOR: 0.42, 95% CI: (0.12, 1.42)] and for children who were breastfed from 21 to 24 months [AOR: 0.77, 95% CI: (0.33, 1.81)] compared to children breast fed less than 18 months.

Children who were stunted were 2 times more likely to have fine motor delay than children who were not [AOR: 2.04, 95% CI: (1.11, 3.74)].

Females were 2 times more likely to have fine motor delay than males [AOR: 2.15, 95% CI: (1.18, 3.89)].

Children who had mothers in the primary school were 71% less likely [AOR: 0.12, 95% CI: (0.14, 0.70)] and children who had mothers in the secondary school and above were 80% less likely [AOR: 0.20, 95% CI: (0.06, 0.70)] to have fine motor delay than mothers who didn't have any formal education. (Table 6)

Table 6: Association between child characteristics socio demographic and nutritional characteristics with fine motor delay among children aged 20 to 24 months in Butajira, Ethiopia 2019

Characteristics		Fine motor delay			
		Case	**Control**	**COR (95%CI)**	**AOR(95%CI)**
Duration of breastfeeding	Less than 18	11(22.45)	38(77.55)	I	I
	18-20 month	6(15.00)	34(85.00)	0.60(0.20 1.82)	0.42(0.12 1.42)
	21-24 month	66(27.16)	177(72.84)	1.28(0.62 2.66)	0.77 (0.33 1.81)
Dietary diversity	Inadequate	76(24.76)	231(75.24)	I	I
	Adequate	7(28.00)	18(72.00)	1.18 (0.47 2.93)	1.77(0.60 5.16)
Starting of solid foods	<6 month	10(32.26)	21(67.74)	I	I
	6-8 month	46(20.44)	179(79.56)	0.53 (0.23 1.22)	0.62 (0.25 1.53)
	9-11 month	15(31.91)	32(68.09)	0.98 (0.37 2.59)	0.85(0.29 2.50)
	>12 month	12(41.38)	17(58.62)	1.48 (0.51 4.25)	1.64 (0.51 5.22)
Stunting	Normal	32(32.65)	66(67.35)	**I**	**I**
	Stunted	51(21.79)	183(78.21)	**1.73(1.03 2.93)***	**2.04(1.11 3.74) ***
Sex of the child	Male	36(21.43)	132(78.57)	I	I
	Female	47(28.66)	117(71.34)	1.47 (0.89 2.42)	**2.15(1.18 3.89) ***
Birth order	First	14(22.95)	47(77.05)	**I**	**I**
	Second	8(12.90)	54(87.10)	0.49(0.19 1.28)	0.42(0.14 1.27)
	Third	23(34.85)	43(65.15)	1.79(0.82 3.92)	1.90(0.71 5.10)
	>=4	38(26.57)	105(73.43)	1.21(0.60 2.45)	0.71(0.25 2.00)
Age of the mother at birth	<25	21(25.30)	61(24.50)	I	I
	25-29	35(42.17)	101(40.56)	1.00 (0.53 1.88)	1.11 (0.22 5.55)
	30-34	22(26.51)	64(25.70)	0.99 (0.49 1.99)	0.65 (0.12 3.34)
	>35	5(6.02)	23(9.24)	0.63(0.21 1.87)	0.47 (0.08 2.72)

Educational status of the mother	No formal education	48(57.83)	93(37.65)	I	I
	Primary school(1-9)	29(34.94)	108(43.72)	**0.52(0.30 0.89)***	**0.29(0.12 0.70)***
	Secondary and above	6(7.23)	46(18.62)	**0.25 (0.10 0.63)***	**0.20(0.06 0.70)***
Wealth index	Lower	24(31.58)	52(68.42)	I	I
	Second	18(26.47)	50(73.53)	0.78 (0.37 1.60)	0.85 (0.37 1.92)
	Middle	22(28.95)	54(71.05)	0.88(0.44 1.76)	1.03 (0.47 2.24)
	Fourth	11(17.19)	53(82.81)	0.44 (0.20 1.01)	0.54 (0.20 1.44)
	Higher	8(16.67)	40(83.33)	0.43 (0.17 1.06)	0.83(0.28 2.45)
Mode of delivery	Spontaneous Vaginal delivery	78(24.61)	239(71.39)	I	I
	Instrumental delivery	5(33.33)	10(66.67)	1.53(0.50 4.61)	1.35 (0.36 5.04)
Place of birth	Health facility	16(30.77)	36(9.23)	I	I
	Home delivery	67(23.93)	213(76.07)	0.70(0.36 1.35)	1.10(0.52 2.31)

7. Discussion

This study aimed to assess the association between duration of breastfeeding and fine motor delay among children aged 20 to 24 months. We didn't find significant protective effect of breastfeeding for fine motor delay for children who were breastfed from 18 to 20 months and for children who were breastfed from 21 to 24 months compared to children breastfed less than 18 months.

Breastfeeding is known to have a significant effect on child growth and development but in our study, we didn't find a significant protecting effect of breastfeeding for fine motor development. Similar to our study, some studies didn't find a significant effect of breastfeeding on fine motor development. A study done in rural Brazil at 12 months didn't find the effect of breastfeeding and suggested home stimulation, maternal education and income were great influences (32). Also, a study in Singapore studied the duration as less than 1 month, 1-3 months, 3-6 months, 6-12 months and greater than 12 months and found the duration of breastfeeding to have a protective effect at 3 and 6 months but didn't find the effect of breastfeeding on fine motor development at 24 months (31). A study in the UK that assessed the duration of breastfeeding more than 4 months and fine motor outcome at 9 months found a benefit of increasing duration of breastfeeding but showed the effect of breastfeeding disappeared after controlling for socioeconomic status. And suggest that socioeconomic status was a great predictor (30).

All the studies acknowledged that breastfeeding is important for development but they suggested that other factors were influencing fine motor delay. A systematic review also showed development is influenced by different environmental and psychological factors the effect of other factors also needs to be put into consideration (71). All these studies have used different developmental screening tools so the comparison should be done cautiously.

Contrary to our study different studies have found a significant effect of breastfeeding. A study in Malawi among children who breastfeed from 9 to 10 months found a small but significant protective effect on fine motor development at 12 to 18 months. They found a persisting effect of breastfeeding on fine motor development after controlling for educational, psychological and socioeconomic factors (29). Also, studies in western countries, a study done in Taiwan and Greece assessed the effect of duration of breastfeeding more than 6 months and fine motor assessed at 18 months. They found that any increase in the duration of breastfeeding was

associated in decreasing in odds of fine delay which persisted after controlling for different factors (27) (26).

In the Taiwan study, they have used similar developmental screening tools with our study and could be comparable to our study but they have given a general breastfeeding category of greater than 6 months and so couldn't exactly appreciate the duration of breastfeeding. And have shown that mothers who breastfeed longer were older, had a university education and were from better socioeconomic class and suggested that the positive result could be due to the presence of these factors (27). These factors were different in our setting, majority of the mothers in this study who breastfeed for longer durations were less educated. Studies have shown that mothers who are more educated create a more favorable and stimulating environment which can be helpful for child development (72, 73). This could be the reason why we couldn't find a significant association.

Another study in France also found significant and strong associations with breastfeeding duration and fine motor outcome at 2 and 3 years after controlling for different factors (74). A study in USA also found an increasing duration of breastfeeding 3 to 6 months, 6 to 9 months, greater than 9 months and found that increasing duration protects fine delay by 51%, 33%, and 36% respectively (25). These studies were done in developing countries where the mothers were mothers who breastfeed were highly educated and were from better socio-economic status and the effect of breastfeeding alone might not be well appreciated.

The studies generally classified breastfeeding categories as greater than 6 months (27) (26) or had a limited age group of breastfeeding duration and the effect of breastfeeding by different durations was not appreciated, they gave a general conclusion(29) (27). But they have found a general effect of increasing duration of breastfeeding on fine motor development. Some studies were also from developed countries (25, 74) Also the tool they used to assess developmental delay was a different tool so the comparison needs to be taken into consideration.

We need to put into consideration the area in which the study was done. Since most of the mothers in the area breastfeed for longer durations the effect of not breastfeeding resulting fine motor delay could not be appreciated. But other environmental and nutritional factors could be the reason why we couldn't get protective effects of breastfeeding.

Another factor that we have found significant for fine motor development was stunting. Children who were stunted were 2 times more likely to have fine motor delay than children who were not. This is similar to many studies that malnutrition can affect the growth and development of

children. Studies done in Jimma, Tanzania and Brazil have shown similar finding (4, 38, 39). Another study in Jimma found at 2 years malnourished children lagged by (71.4%) on fine motor development compared to non-malnourished children (21). And have shown that stunting is associated with brain development. Children growing in resource-limited areas such as sub-Saharan countries have high odds of being stunted (75). This will put them at a high risk to have delayed development.

Stunted children are at high risk for a developmental delay because the physical growth and development of the brain will be limited because of inadequate supply for its growth. This can be explained by a lack of adequate nutrients for growth and development that can further affect physical growth and the structure of the brain and neurodevelopmental potential (38). To aggravate the problem children who are stunted or malnourished will be provided with less playing materials and less stimulation from their caretakers which can further deprive their development and leading to developmental delay (38).

Also, we have found the education level of the mother to be significantly associated with fine motor delay. Children who had mothers in the primary and secondary school were less likely to have fine motor delay than mothers who didn't have formal education. Studies that have found a protective effects of breastfeeding on fine motor have suggested that the majority of the mothers who breastfeed longer were more educated and suggested that this characteristic of the mothers' aid for the development of the child (26, 27). Another study in brazil didn't find significant effect of breastfeeding on motor development suggested that most of the mothers in their study population had a lower educational status and suggested the maternal characteristics were affecting the development of the children. Similarly, in our study population, most of the mothers had lower education status and this could be the reason why we couldn't find a protective effect of breastfeeding on fine motor development. Studies have shown that a mother's education is important because as the educational level of the mother increases the level of stimuli the mother gives to her child also increases (72). Also, as the education level of the parents increases the socioeconomic status also could increase and will create a more favorable environment for the children (42). While this is not true in developing countries, mothers who breastfeed longer were less educated and were form low socioeconomic status (9).

Another factor that we found significant was the sex of the child. We have found females have greater odds of being affected by fine motor delay than males. Contrary to our study different studies have suggested females have a better score on fine motor and boys have a higher risk to

have developmental delay(52, 53). While we cannot give a general conclusion but other factors in the environment could affect the development of females. A study in India has shown that Girls are breastfed for shorter durations than boys due to the gender preferences by the mothers. Mothers will start early weaning for girls than boys to have another pregnancy and not to delay another pregnancy (51). The gender preferences by the mother could affect the duration of breastfeeding and the care the child will have (49). This gender preference could lead to having a developmental delay in the female population.

This study still supports that breastfeeding is important for child development. But we have found stunting, sex of the child and educational status of the mother to be significantly associated with fine motor delay in the population that we studied. Therefore, having a holistic approach to prevent developmental delay is needed. Preventing child malnutrition and giving proper care to all children is important.

8. Strengths and limitations of the study

8.1 Strength of the study

The study was a community-based case-control study. Validated tool in our setting was used which could better measure the case of interest. New cases were used that were identified at the time of data collection which could prevent misclassification bias.

8.2 Limitations of the study

The following limitation needs to be taken in to account when interpreting the results. Since the mothers were asked on their breastfeeding and dietary practices with in the past 2 years, there could be recall bias. Dietary diversity was asked only once and repeated measure will be better to capture the real intake. Children who were scored Suspected or Refusal with Denver II needed a repeated measurement to confirm the result but due to limited resources and time the screening was done only once. Even though birth weight is an important factor for development we didn't have information on the birth weight of the children.

9. Conclusion and recommendations

9.1 Conclusion

We didn't find a significant protective effect of duration of breastfeeding on fine motor development from 20 to 24 months.

Stunted children have greater odds of becoming suspect for fine motor delay.

Females have higher odds of being suspect for fine motor delay than males.

Children who had mothers in the primary and secondary school were less likely to have fine motor delay than mothers who didn't have formal education.

9.2 Recommendations

Program recommendation

Programs that screening on assessment of developmental delay

Should work to decrease child malnutrition

Since mothers are the primary care takes and we have found maternal education to improve developmental outcome therefore programs that work on improving the educational status of women is important.

Researchers

Further studies should be done in a different setup to appreciate the difference and the effect of other environmental factors.

Further follow up studies should be done.

We haven't assessed the effect of genetics, but there are arguments about the effect of genetics versus environmental factors therefor, studies should be done to that assess the effect of genetics and environmental factors.

10. References

1. Tasnim S. Effect of breast feeding on child development: at birth and beyond. South East Asia Journal of Public Health. 2014;4(1):4-8.
2. Kumar N, Poswal L, Goyal S, Chaudhary C, Rattan A, Koli H. Micronutrient deficiency status in children below 2 year of age with delayed milestones. International Journal of Contemporary Pediatrics. 2018;5(4):1542-5.
3. Blakemore SJ, Choudhury S. Development of the adolescent brain: implications for executive function and social cognition. Journal of child psychology and psychiatry. 2006;47(3-4):296-312.
4. Sudfeld CR, McCoy DC, Fink G, Muhihi A, Bellinger DC, Masanja H, et al. Malnutrition and its determinants are associated with suboptimal cognitive, communication, and motor development in Tanzanian children. The Journal of nutrition. 2015;145(12):2705-14.
5. Ali SS. A brief review of risk-factors for growth and developmental delay among preschool children in developing countries. Advanced biomedical research. 2013;2.
6. Walker SP, Wachs TD, Gardner JM, Lozoff B, Wasserman GA, Pollitt E, et al. Child development: risk factors for adverse outcomes in developing countries. The lancet. 2007;369(9556):145-57.
7. Organization World Health Organization. Indicators for assessing infant and young child feeding practices: part 2: measurement. 2010.
8. Oddy WH, Li J, Robinson M, Whitehouse AJ. The long-term effects of breastfeeding on development. Contemporary pediatrics: InTech; 2012.
9. Victora C, Bahl R, Barros A, França G, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet 387, 475e490. 2016.
10. Black MM, Walker SP, Fernald LC, Andersen CT, DiGirolamo AM, Lu C, et al. Early childhood development coming of age: science through the life course. The Lancet. 2017;389(10064):77-90.
11. Demilew YM, Tafere TE, Abitew DB. Infant and young child feeding practice among mothers with 0–24 months old children in Slum areas of Bahir Dar City, Ethiopia. International breastfeeding journal. 2017;12(1):26.
12. Black MM, Lawn JE. Early childhood developmental disabilities—data still needed. The Lancet Global Health. 2018;6(10):e1050-e1.

13. Fernald LC, Prado E, Kariger P, Raikes A. A toolkit for measuring early childhood development in low and middle-income countries. 2017.

14. Prado EL, Dewey KG. Nutrition and brain development in early life. Nutrition reviews. 2014;72(4):267-84.

15. Syafril S, Susanti R, El Fiah R, Rahayu T, Pahrudin A, Yaumas NE, et al. Four Ways of Fine Motor Skills Development in Early Childhood. 2018.

16. Walle EA, Campos JJ. Infant language development is related to the acquisition of walking. Developmental Psychology. 2014;50(2):336.

17. Petersen IT, Bates JE, Dodge KA, Lansford JE, Pettit GS. Describing and predicting developmental profiles of externalizing problems from childhood to adulthood. Development and psychopathology. 2015;27(3):791-818.

18. Esposito G, Pasca S. Motor abnormalities as a putative endophenotype for Autism Spectrum Disorders. Frontiers in integrative neuroscience. 2013;7:43.

19. Perna R, Loughan AR. Early developmental delays: A cross validation study. Journal of Psychological Abnormalities. 2013:1-6.

20. Ayele M. Developmental Delays among Infants and Young Children in Addis Ababa:

Screening, Risk Factors and Intervention Doctoral Dissertation: Addis Ababa University; 2014.

21. Abessa TG, Bruckers L, Kolsteren P, Granitzer M. Developmental performance of hospitalized severely acutely malnourished under-six children in low-income setting. BMC pediatrics. 2017;17(1):197.

22. Agency Central Statistics Agency. Ethiopia Demographic and Health Survey 2016 Key Indicators Report. Addis Ababa, Ethiopia: Central Statistical Agency; 2016.

23. Central Statisitcs Agency, ICFInternational. Ethiopia demographic and health survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International. 2012;430.

24. Organization World Health Organization. World health statistics 2016: monitoring health for the SDGs sustainable development goals: World Health Organization; 2016.

25. Dee DL, Li R, Lee L-C, Grummer-Strawn LM. Associations between breastfeeding practices and young children's language and motor skill development. Pediatrics. 2007;119(Supplement 1):S92-S8.

26. Leventakou V, Roumeliotaki T, Koutra K, Vassilaki M, Mantzouranis E, Bitsios P, et al. Breastfeeding duration and cognitive, language and motor development at 18 months of age: Rhea mother–child cohort in Crete, Greece. J Epidemiol Community Health. 2015;69(3):232-9.

27. Chiu WC, Liao HF, Chang PJ, Chen PC, Chen YC. Duration of breast feeding and risk of developmental delay in Taiwanese children: a nationwide birth cohort study. Paediatric and perinatal epidemiology. 2011;25(6):519-27.

28. Ali SS, Dhaded SG. The impact of nutrition on child development at 3 years in a rural community of India. International journal of preventive medicine. 2014;5(4):494.

29. Kumwenda C, Hemsworth J, Phuka J, Ashorn U, Arimond M, Maleta K, et al. Association between breast milk intake at 9–10 months of age and growth and development among Malawian young children. Maternal & child nutrition. 2018:e12582.

30. Sacker A, Quigley MA, Kelly YJ. Breastfeeding and developmental delay: findings from the millennium cohort study. Pediatrics. 2006;118(3):e682-e9.

31. Cai S, Pang WW, Low YL, Sim LW, Sam SC, Bruntraeger MB, et al. Infant feeding effects on early neurocognitive development in Asian children–. The American journal of clinical nutrition. 2014;101(2):326-36.

32. Eickmann SH, De Lira PIC, Lima MdC, Coutinho SB, Teixeira MdLPD, Ashworth A. Breast feeding and mental and motor development at 12 months in a low-income population in northeast Brazil. Paediatric and perinatal epidemiology. 2007;21(2):129-37.

33. Muhoozi GK, Atukunda P, Mwadime R, Iversen PO, Westerberg AC. Nutritional and developmental status among 6-to 8-month-old children in southwestern Uganda: a cross-sectional study. Food & nutrition research. 2016;60(1):30270.

34. Larson LM, Young MF, Ramakrishnan U, Webb Girard A, Verma P, Chaudhuri I, et al. A cross-sectional survey in rural Bihar, India, indicates that nutritional status, diet, and stimulation are associated with motor and mental development in young children. The Journal of nutrition. 2017;147(8):1578-85.

35. Wright MJ, Bentley ME, Mendez MA, Adair LS. The interactive association of dietary diversity scores and breast-feeding status with weight and length in Filipino infants aged 6–24 months. Public health nutrition. 2015;18(10):1762-73.

36. Rah JH, Akhter N, Semba RD, De Pee S, Bloem MW, Campbell A, et al. Low dietary diversity is a predictor of child stunting in rural Bangladesh. European journal of clinical nutrition. 2010;64(12):1393.

37. Mitchodigni IM, Hounkpatin WA, Ntandou-Bouzitou G, Avohou H, Termote C, Kennedy G, et al. Complementary feeding practices: determinants of dietary diversity and meal frequency among children aged 6–23 months in Southern Benin. Food Security. 2017;9(5):1117-30.

38. Worku BN, Abessa TG, Wondafrash M, Vanvuchelen M, Bruckers L, Kolsteren P, et al. The relationship of undernutrition/psychosocial factors and developmental outcomes of children in extreme poverty in Ethiopia. BMC pediatrics. 2018;18(1):45.

39. da Costaa AGdS, Netob JLC. Fine motor development in children with chronic malnutrition 1. Cadernos de Terapia Ocupacional da UFSCar. 2019;27(1):54-60.

40. Ronfani L, Brumatti LV, Mariuz M, Tognin V, Bin M, Ferluga V, et al. The complex interaction between home environment, socioeconomic status, maternal IQ and early child neurocognitive development: a multivariate analysis of data collected in a newborn cohort study. PLoS One. 2015;10(5):e0127052.

41. Prado EL, Abbeddou S, Adu-Afarwuah S, Arimond M, Ashorn P, Ashorn U, et al. Predictors and pathways of language and motor development in four prospective cohorts of young children in Ghana, Malawi, and Burkina Faso. Journal of Child Psychology and Psychiatry. 2017;58(11):1264-75.

42. Gómez-Sanchiz M, Cañete R, Rodero I, Baeza JE, González JA. Influence of breast-feeding and parental intelligence on cognitive development in the 24-month-old child. Clinical pediatrics. 2004;43(8):753-61.

43. Oddy WH, Li J, Landsborough L, Kendall GE, Henderson S, Downie J. The association of maternal overweight and obesity with breastfeeding duration. The Journal of Pediatrics. 2006;149(2):185-91.

44. Merewood A, Patel B, Newton KN, MacAuley LP, Chamberlain LB, Francisco P, et al. Breastfeeding duration rates and factors affecting continued breastfeeding among infants born at an inner-city US Baby-Friendly hospital. Journal of Human Lactation. 2007;23(2):157-64.

45. Grace T, Oddy W, Bulsara M, Hands B. Breastfeeding and motor development: A longitudinal cohort study. Human movement science. 2017;51:9-16.

46. Bushnik T, Garner R. The children of older first-time mothers in Canada: their health and development: Statistics Canada Ottawa, Canada; 2008.

47. Uzoigwe OF. Breastfeeding and adult intelligence. The Lancet Global Health. 2015;3(9):e521.

48. Buckles K, Kolka S. Prenatal investments, breastfeeding, and birth order. Social Science & Medicine. 2014;118:66-70.

49. De Haan M, Plug E, Rosero J. Birth order and human capital development evidence from ecuador. Journal of Human Resources. 2014;49(2):359-92.

50. Taylor JS, Geller L, Risica PM, Kirtania U, Cabral HJ. Birth order and breastfeeding initiation: results of a national survey. Breastfeeding Medicine. 2008;3(1):20-7.

51. Jayachandran S, Kuziemko I. Why Do Mothers Breastfeed Girls Less Than Boys? Evidence and Implications for Child Health in India, NBER Working Paper. 2009;15041.

52. Clark KM, Castillo M, Calatroni A, Walter T, Cayazzo M, Pino P, et al. Breast-feeding and mental and motor development at 5½ years. Ambulatory Pediatrics. 2006;6(2):65-71.

53. Koutra K, Chatzi L, Roumeliotaki T, Vassilaki M, Giannakopoulou E, Batsos C, et al. Socio-demographic determinants of infant neurodevelopment at 18 months of age: Mother–Child Cohort (Rhea Study) in Crete, Greece. Infant Behavior and Development. 2012;35(1):48-59.

54. Pahlevanian AA, Ahmadizadeh Z. Relationship between gender and motor skills in preschoolers. Middle East Journal of Rehabilitation and Health. 2014;1(1).

55. Van Doorn MM, Kuijpers RC, Lichtwarck-Aschoff A, Bodden D, Jansen M, Granic I. Does mother–child interaction mediate the relation between maternal depressive symptoms and children's mental health problems? Journal of child and family studies. 2016;25(4):1257-68.

56. Ribeiro DG, Perosa GB, Padovani FHP. Mental Health, Mother-Child Interaction and Development at the End of the First Year of Life1. Paidéia (Ribeirão Preto). 2014;24(59):331-9.

57. Weaver JM, Schofield TJ, Papp LM. Breastfeeding duration predicts greater maternal sensitivity over the next decade. Developmental psychology. 2018;54(2):220.

58. Forns J, Julvez J, García-Esteban R, Guxens M, Ferrer M, Grellier J, et al. Maternal intelligence-mental health and child neuropsychological development at age 14 months. Gaceta sanitaria. 2012;26(5):397-404.

59. Yemane Berhane PB. BUTAJIRA DSS ETHIOPIA. 2000.

60. Medhin G, Hanlon C, Dewey M, Alem A, Tesfaye F, Worku B, et al. Prevalence and predictors of undernutrition among infants aged six and twelve months in Butajira, Ethiopia: the P-MaMiE Birth Cohort. BMC public health. 2010;10(1):27.

61. Frankenburg W, Dodds J, Archer P, Bresnick B, Maschka P, Edelman N, et al. Denver II training manual. Denver Developmental Materials. Inc, Denver. 1990.

62. Organization World Health Organization. World Health Organization Child Growth Standards: World Health Organization. Geneva; 2006.

63. Abessa TG, Worku BN, Kibebew MW, Valy J, Lemmens J, Thijs H, et al. Adaptation and standardization of a Western tool for assessing child development in non-Western low-income context. BMC Public Health. 2016;16(1):652.

64. Tesfayohannes H. Examination of the Validity of the Denver II Child Development Measurement Tool among Children 24-36 Months against the Gold Standard of Bayley Scale III Edition in Butajira, Ethiopia: Addis Ababa University; 2017.

65. Care CTFoPH. Recommendations on screening for developmental delay. Canadian Medical Association Journal. 2016;188(8):579-87.

66. Slykerman R, Thompson J, Becroft D, Robinson E, Pryor J, Clark P, et al. Breastfeeding and intelligence of preschool children. Acta paediatrica. 2005;94(7):832-7.

67. Arimond M, Abbeddou S, Kumwenda C, Okronipa H, Hemsworth J, Jimenez EY, et al. Impact of small quantity lipid-based nutrient supplements on infant and young child feeding practices at 18 months of age: results from four randomized controlled trials in Africa. Maternal & child nutrition. 2017;13(3):e12377.

68. Aboud FE, Akhter S. A cluster-randomized evaluation of a responsive stimulation and feeding intervention in Bangladesh. Pediatrics. 2011:peds. 2010-160.

69. Ulijaszek SJ, Kerr DAJBJoN. Anthropometric measurement error and the assessment of nutritional status. 1999;82(3):165-77.

70. Hosmer Jr DW, Lemeshow S, Sturdivant RX. Applied logistic regression: John Wiley & Sons; 2013.

71. Walfisch A, Sermer C, Cressman A, Koren G. Breast milk and cognitive development—the role of confounders: a systematic review. BMJ open. 2013;3(8):e003259.

72. Playford CJ, Dibben C, Williamson L. Socioeconomic disadvantage, fetal environment and child development: linked Scottish administrative records based study. International journal for equity in health. 2017;16(1):203.

73. Dabar D, Das R, Nagesh S, Yadav V, Mangal A. A Community-based Study on Growth and Development of Under-Five Children in an Urbanized Village of South Delhi. Journal of tropical pediatrics. 2016:fmw026.

74. Bernard JY, De Agostini M, Forhan A, Alfaiate T, Bonet M, Champion V, et al. Breastfeeding duration and cognitive development at 2 and 3 years of age in the EDEN mother–child Cohort. The Journal of pediatrics. 2013;163(1):36-42. e1.

75. Jimoh AO, Anyiam JO, Yakubu AM. Relationship between child development and nutritional status of under-five Nigerian children. South African Journal of Clinical Nutrition. 2018;31(3):50-4.

11. Annexes

Annex 1: Subject information sheet in English

Hello, my name is ……I am here to have an interview with you on behalf of Rediate Shiferaw. She is a student of Addis Ababa University School of public health conducting research on breastfeeding duration and motor development for partial fulfillment of masters of public health. She received permission from Addis Ababa university school of public health to conduct this study.

You are selected randomly to participate in this study because you are a mother with a child aged 20 to 24 months. Your participation in this study is voluntary. If you agree to participate in the study, you will be asked to answer some questions about yourself, your delivery experience and your breastfeeding practice and your child's growth and development. The interview with you will take about 30 minutes. It is your right to be willing to participate in the study or not. If you are willing, you have the right to stop at any time or withdraw without giving any reason which you will not be subjected to any ill-treatment.

The study will help you to give the appropriate nutritional care for your child and exercise the recommended breastfeeding practice.

The information that you provide will be kept confidential by using only code numbers and locking the data. Only the members of the study team will have access to the non-coded data and the data will not be used for purposes other than the study. Your willingness and active participation are very important for the success of this study.

If you need any further information or explanation regarding the study, you can have this address to contact.

Name – Rediate Shifreaw

Tel no – 0932150898

E-mail – redshf@gmail.com

Do you have any questions?

Based on the information provided are you willing to participate in the study?

Yes____ No_____

If Yes- read the consent form to the participant, sign it and continue the interview.

If No- Thank and skip to the next participant.

Annex 2: Informed consent sheet in English

Informed consent Certified by:

Respondent's signature ----------Date----------

Interviewer: Name---------- Signature----------

Questionnaire number----------

Date of interview----------Time started----------Time completed----------

Result of interview:

1. Completed ☐
2. Respondent not available ☐
3. Refused ☐
4. Partially completed ☐

Checked by: Supervisor: Name _____ Signature_____

Annex 3: Questionnaire in English

Q. Id. _____

Identification

No/code _____district_____ kebele name_____

Name of the respondent _____ House hold number_____

Relation of respondent with the child

Parent……...1

Grandparent…….2

Brother/Sister……3

House help…….4

Name of the interviewer _____Date of the interview _____

Time started_____ Time finished _____

Part 1. Maternal and household socioeconomic and demographic characteristics

I will start by asking you about you about yourself and your house hold characteristics.

	Question	Answer	Special instruction
101	What is your relationship with the child?	Mother…….....1 Caregiver:……..…...2	
102	Age in complete years	Year……..	
103	What is your religion?	Muslim…….……...…...1 Orthodox: ……...…...2 Protestant……...……. 3 Catholic……. …...…….4 other(_____)	
104	What is the marital status of the child's parents or caregivers?	Married ……..……1 Living together …….…….2 Divorced/separated …….…...3	

		Single……4 Widowed ……...…….5 Widower……...6	
105	Who is the primary caretaker of the child?	Mother.……....1 Father…….2 Grandparent…..……...3 Brother/Sister……4 House help……..….5	If the answer is 1 or 2 skip Q. 106 and Q. 107
106	Have the caretaker of the child attended any school?	Yes …….....……1 No …….....……2	If no skip to question number 107
107	What is the highest level of education attended?	Illiterate……1 read and write…….....……2 Primary school (1-8) ……..……3 Secondary school and preparatory school (9_12) ……..….4 Technical/vocational…….....5 Higher…….……..6	
108	Have the mother of the child attended any school?	Yes……1 No…….2	If no skip to question number 109
109	What is the highest level of education attended?	Illiterate…….…….……1 read and write…….……2 Primary school (1-8) ……..…3 Secondary school and preparatory school (9_12) ……..….4 Technical/vocational……5 College & above……....6	

110	What is the occupation of the mother?	House wife……1 Farmer……2 Employee ……3 Merchant……4 Local drink seller ……5 Student……6 Private business……7 No job……8 Other (specify_____)	
111	Has the father of the child attended any school?	Yes ……1 No ……2	If no skip to question number 112
112	What is the highest level of education attended?	Illiterate……1 read and write……2 Primary school (1-8) ……3 Secondary school and preparatory school (9_12) ……4 Technical/vocational……5 Higher……6	
113	Size of the household?		
114	Area of the residence	Urban……1 Rural……2	

Household asset measurement			
115.	Owner ship of the house	Private…….……1 Government house …….2 Rent …….……3 Relatives/others house …….....4 Other (specify)_____	
116	What is the main source of drinking water for a member of your households? Circle all that apply	1. Piped water 2. Protected well 3. Unprotected well 4. Protected spring 5. Unprotected spring 6. lake 7. river 8. pond other	
117	How long it takes to fetch water and comeback?	----------time	
118	What kind of toilet facility do you use?	1. Functional pour-flush toilet----------1 2. Nonfunctional pour-flush toilet----------2 3. Functional pit latrine----------3 4. Nonfunctional pit latrine----------4 5. No facility/bush/field----------5 6. Other	
119	What type of fuel do you mainly use for cooking?	1. Electricity----------1 2. Kerosene----------2 3. Charcoal----------3 4. Wood----------4 5. Solar----------5	

		6. Animal dung----------6 7. Other(specify)_____	
120	Does your household have	Yes No	
	- Electricity	1 2	
	- Radio	1 2	
	- Television	1 2	
	- Mobile telephone	1 2	
	- Refrigerator	1 2	
	- watch/ clock	1 2	
	- Table	1 2	
	- Chair	1 2	
	- Bed with cotton/sponge - Mattress	1 2	
	- electric “mated”	1 2	
	- Kerosene lamp	1 2	
121	Does any member of this household own	Yes No	
	- Car/truck	1 2	
	- Motor cycle	1 2	
	- Bicycle	1 2	
	- Animal-drawn cart	1 2	

122	Does this household own any livestock, herds, other farm animals, or poultry?	1. Yes…….....1 2. No…….2	If No, skip question no. 121
123	How many of the following animals does this household own?		
	- Milk cow or bulls	|__|__|	
	- Livestock/other cattle	|__|__|	
	- Horse, donkey, mules	|__|__|	
	- Sheep	|__|__|	
	- Goats	|__|__|	
	- Chicken	|__|__|	
	- Beehives	|__|__|	
124	Does any member of this household own any crop land?	1. Yes 2. No	If No, skip to question no. 123
125	How many (local units) of agricultural land do members of this	Local units_____	

	household own?		
126	Main material of the roof Remark Observe the material of the construction	1. Thatch/leaf/mud/ Reed/Bamboo ……1 2. Corrugated iron/metal ……2 3. Wood planks ……3 4. Rustic mat/plastic sheet ……4 5. Cement/concrete ……5 Other (specify)_____	
127	The main material of the floor	1. Mud ……1 2. Parquet/polished wood ……2 3. Cement ……...3 4. Ceramic tiles ……4 5. Carpet ……5 6. Other (specify) ————	
128	The main material of the wall	1. Wood with mud……1 2. Blocks……..……2 3. Cement with stone……3 4. Bricks……4 5. Corrugated iron/metal……...5 Other(specify) ————	

Part 2: Under-five's background

Now I am going to ask you about your child.

Remark

Ask the mother or caretaker of the child.

No	Questions		
201	Name of the child		
202	What is the sex of the child?	1. Male ……1	

		2. Female ……..2	
203	What is the child's date of birth? (in E.C)	_____/_____/_____ Date/month/year	
204	How old is (*name*)? Remark Use maternal memory, birth certificate, vaccination or another card that have age of child If responses to 201 and 202 are inconsistent, probe further and correct.	(in completed months)……	
205	What is the birth order of the child?		

Part 3: Breastfeeding practice

Now I'm going to ask you about your pregnancy, childbirth and breastfeeding experience

No	Question	Categories	Special instruction
301	Where did you give birth to (name)?	1. Home…….……1 2. Health facility……..…2 3. On the way to the health facility…….3	
302	Mode of delivery	1. spontaneous vaginal delivery…….1 2. Assisted vaginal delivery…….2 3. Cesarean section…….…….3	
303	Has (name) ever been breastfed?	1. Yes…….……1 2. No…….……2 3. Don't know……98	If the answer is No/ Don't know skip to

			question # 306
304	When was breastfeeding initiated after birth?	1. Immediately (Less than one hour) …….1 2. Between 1 and 23 hours…….2 3. More than 24 hours…….3 4. Don't know……..…….98	
305	Did you feed (name) with the first yellowish milk (colostrum)?	1. Yes…….1 2. No…….2 3. I don't know…….98	
306	In the first three days after delivery, was (name) given anything to drink other than breast milk?	1. Yes ……1 2. No …….2 3. I don't know…….98	If the answer is No skip to question # 308
307	What was (name) given to drink?	1. Milk other than breast milk…….1 2. Plain water…….2 3. Sugar or glucose water…….3 4. Sugar-salt-water solution…….4 5. Fruit juice…….5 6. Infant formula…….6 7. Tea…….7 8. Honey…….8 9. Fresh butter…….9 10. Other (specify) …….	
308	How long was he/she fed only breastmilk? (no formula or solids)	Number of months _____	

309	Is he/she still breastfeeding?	1. Yes……1 2. No……2 3. Don't know……98	If no ask 310
310	How old was your baby when he/she stopped talking breastmilk?	Number of months_____	
311	How old was your child when he/she started solid or semi-solid foods?		

Part 4: Breastfeeding and dietary practice by using 24-hour recall

Remark

Ask the mother to recall the child's activity starting from the time the child woke up to sleeping time. Listen to all activities and foods eaten and fill in the form.

No	Question	Categories	Special instruction
401	Was (name) breastfed yesterday during the day or at night?	1. Yes……1 2. No……2 3. Don't know…….98	
402	Yesterday, during the day or at night, did [NAME] receive any of the following?		

		Yes	No	Don't know	
A	Plain water	1	2	3	
B	Infant formula	1	2	3	
C	Animal milk	1	2	3	
D	Juice or juice drinks	1	2	3	
E	Yogurt	1	2	3	
F	Thin porridge	1	2	3	
G	Tea or coffee with milk	1	2	3	
H	Any other water-based liquids	1	2	3	
403	Yesterday, during the day or at night, did [NAME] eat any of the following foods?	Yes	No	Don't know	
A	Porridge, bread, rice, noodles or other foods made from grains	1	2	3	
B	Pumpkin, carrots, squash or sweet potatoes yellow or orange inside	1	2	3	
C	White potatoes, cassava, bulla or any other foods made from roots	1	2	3	
D	Any dark green leafy vegetables	1	2	3	
E	Ripe mangoes, ripe papayas	1	2	3	
F	Any other fruits or vegetables	1	2	3	

G	Liver, kidney, heart or other organ meats	1	2	3	
H	Any meat, such as beef, pork, lamb, goat, chicken	1	2	3	
I	Eggs	1	2	3	
J	Any fresh or dried fish or shellfish	1	2	3	
k	Any foods made from beans, peas, lentils, nuts, or seeds	1	2	3	
L	Cheese, yogurt, or other milk products	1	2	3	
M	Any oil, fats, or butter, or foods made with any of these	1	2	3	
N	Any sugary foods such as chocolates, sweets, candies, pastries, cakes, or biscuits	1	2	3	
O	Any commercially fortified baby food	1	2	3	
P	Any food made from teff, like injera, Kita.	1	2	3	

Solid or semi-solid foods

Ask the mother if she recalls solid or liquid the child ate yesterday during the day or the night.

Now I would like to ask you about liquids and solid foods that [NAME] may have had yesterday during the day and at night.

404	Did ***(NAME)*** eat any solid, semi-solid, or soft foods yesterday during the day or at night? IF'YES' PROBE: What kind of solid, semi-solid, or soft foods did (***NAME***) eat?	YES..... 1 NO..... 2 Don't know 98	IF YES GO back to Q403 and recode foods eaten. If No GO to 405
405	Did ***(NAME)*** drink anything from a bottle with a nipple yesterday during the day or night?	YES..... 1 NO..... 2 Don't know 98	

Part 5. Anthropometry measurement

	Anthropometry(AN)		
501	MEASURER'S NAME AND NUMBER:	NAME ___ ___ ___	
502	RECORD THE RESULT OF WEIGHT MEASUREMENT AS READ OUT BY THE MEASURER: READ THE RECORD BACK TO THE MEASURER AND ALSO ENSURE THAT HE/SHE VERIFIES YOUR RECORD.	KILOGRAMS (KG) ___ _._ _□□ □□ CHILD NOT PRESENT 1 CHILD REFUSED 2 RESPONDENT REFUSED 3 OTHER (specify) 4	
503	WAS THE CHILD UNDRESSED TO THE MINIMUM?	YES 1 NO, THE CHILD COULD NOT BE UNDRESSED TO THE MINIMUM 2	
504	THE CHILD IS LESS THAN 2 YEARS OLD AND SHOULD BE MEASURED LYING DOWN. RECORD THE RESULT OF LENGTH MEASUREMENT AS READ OUT BY THE MEASURER: READ THE RECORD BACK TO THE MEASURER AND ALSO ENSURE THAT HE/SHE VERIFIES YOUR RECORD.	LENGTH / HEIGHT (CM) _□□ □□._ ___ CHILD REFUSED 1 RESPONDENT REFUSED 2 OTHER (specify) 3	
505	HOW WAS THE CHILD ACTUALLY MEASURED? LYING DOWN OR STANDING UP?	LYING DOWN 1 STANDING UP 2	
AN15.Thank the respondent for his/her cooperation and inform your Supervisor that the Measurer and you have completed all the measurements in this household.			

Part 6 HOME Inventory- Observation and Interview [Aboud modification]

The interview should be relaxed, non-judgmental and friendly. Talk to the mother while observing mother-child interactions. Observe when you can; ask the question when you cannot observe (Q items).

The child should be in the same place doing his/her usual activities.

No.	1. Responsivity (Observation)	Circle No or Yes	
601.	The mother spontaneously talked to the child.	0,1= No	2+ = Yes
602.	The mother responds verbally to the child's talk. (does not ignore; not include scold or shout)	No	Yes
603.	The mother tells child the name of an object or person during visit.	No	Yes
604.	The mother's speech is distinct, clear, audible.	No	Yes
605.	The mother begins talking to interviewer about anything. (not only responds to your questions)	No	Yes
606.	The mother talks well and freely to the interviewer.	No	Yes
607.	Mother permits the child to play freely (includes mess, noise)	No	Yes
608.	The mother spontaneously praises child without prompt.	No 0,1 times	2+ = Yes
609.	The mother's voice conveys positive feelings towards child.	No	Yes
610.	Mother caress, stroke head, or kiss the child.	No	Yes
611.	After the visitor praises child, mother responds positively. (e.g. mother nods, smiles, thanks, agrees)	No	Yes
612.	Mother makes an effort to provide child with play objects during visit.	No	Yes

2. Acceptance			
613.	The mother shouts at child.	No Reverse Score	Yes
614.	The mother complains about child, or says child is bad.	No	Yes
615.	Mother hits, pushes, shakes child during the visit.	No	Yes
616.	(Probe: What type of punishments do you give your child? Physical, denying food) (ask about circumstance)Have you had to hit or shake your child in the past week to discipline**?**	0,1=No	Yes
617.	The mother threatens punishment or criticizes child during visit.	No	Yes
618.	The mother restricts or interferes with child's activity during visit.	No	1,2,3 Yes
619.	At least 3 adult books or magazines are observed at home. (includes religious books but not textbooks)	No	Yes
620.	Does your child have playmates**?**	No	Yes
3. Organization			
621.	Who usually looks after your child when you are away**?**	3+	Mo,1,2
622.	Does your child go to the market? How often**?**	Rare	Weekly
623.	How often does your child go out of the house**?**	<4	4+ a wk.
624.	How often is your child taken out of the village for a trip**?**	Rare	Weekly
625.	Does your child have a place to keep playthings**?** (bag, box)	No	Yes

626.	Observe whether indoor/outdoor play place is safe, bright.	No	Yes
4. Learning Materials "Please show me what your child plays with on his/her own daily."			
627.	Gross motor objects available. e.g. ball, rope, ring, flat stone	No	Yes
628.	Push or pull toys. e.g. pull with string, push box	No	Yes
629.	Any toy with wheels.	No	Yes
630.	Dramatic play materials, e.g. doll, transport, household items.	No	Yes
631.	Simple eye-hand coordination materials. (e.g. single object that rattles, shakes, squeezes)	No	Yes
632.	Complex eye-hand coordination materials. (e.g. different shaped blocks, pencil & paper)	No	Yes
633.	Picture book (not a textbook, can be collection of pictures).	No	Yes
634.	The mother provides materials that are slightly difficult for child. Eg.----------	No	Yes
635.	Does your child play any structured games with people? (eg. Circle games, clapping/singing games)	No	Yes
5. Involvement			
636.	Mother keeps the child within eyesight, looks often.	N0	Yes
637.	When you are busy with housework, do you talk to your child**?**	No/at times	Always
638.	Did you show or teach your child something new this past week, like teach a new word, or help child do something difficult**?**	No	Yes
639.	Did you find/make something new for your child to play with? When did	No	Past

	you get the newest toy**?**		month
640.	In the past week, did you look at pictures in a book, calendar or Magazine with the child**?**	No	Yes
6. Variety			
641.	How often does the father spend time talking, walking, playing with child**?**	No	Daily
642.	When did you last tell your child a story**?**	Rare	Weekly
643.	Does your child eat supper with the whole family**?**	No	Yes
644.	Do you receive guests at home or visit family? If yes, How often**?**	No	Monthly
645.	Does your child have pictures? Three or more picture books for the child.	No	Yes 3+

7. Denver II tool

Directions for the administration of specific items of Denver II

Follow the described procedures exactly, and carefully check the scoring criteria before passing or failing an item. Some items may be passed by the report of the caregiver. These items are distinguished by "R" in the item bars on the test form and by (R) after the item names in the following directions for administration. When scoring an item by report of the caregiver, it is helpful to circle the "R" in the distribution bar on the form to distinguish reported behavior from behavior actually seen. It is preferable that report forms are confirmed by observation.

When administering report items, avoid asking "leading questions" that may suggest an answer to the caregiver. For example, instead of asking, "Your child can drink from a cup, right?" ask, "Does your child drink from a cup?" Take care to ask questions that require the caregiver to supply the necessary information to score the item (more details and/or examples), rather than prompting the caregiver to give the desired response. In addition, asking if a child does something yet, may help the caregiver feel more comfortable in reporting failures.

A pass "P" and no opportunity "NO" will be marked in GREEN

A fail "F" and refusal "R" will be marked in RED

Pass if the child smiles in response. The objective is a social response rather than a physical response.

B. Fine motor – adaptive

1. Follow to midline

With the child lying on his/her back, hold the red yarn above the child's face at a height where he/she focuses on it (usually about 8 inches). Shake the yarn to attract the child's attention and move it slowly in an arc from one side of the child's body to the other several times. The movement of the yarn may be stopped to re-attract the child's attention, and then continued.

Pass if the child follows the yarn to the midpoint of the arc with eyes alone, or with head and eyes.

2. Follow past midline

(Refer to *Follow to midline* for administration procedures)

Pass if the child follows the yarn past the midpoint of the arc with eyes alone, or with head and eyes.

A pass of *Follow past midline* also passes *Follow to the midline*.

3. Grasp rattle

While the child is lying on his/her back or is being held by the caregiver, touch the backs or tips of the child's fingers with the handle of the rattle.

Pass if the child grasps the rattle for a few seconds.

4. Hands together

During the test, while the child is lying on his/her back (not while cradled in the caregiver's arms), notice if the hands are brought together at the midline of the body over the chest or at the mouth.

Pass if you see the child bring his/her hands together in this manner.

5. Follow 180 degrees

(Refer to *Follow to midline* for administration procedure.)

Pass if the child follows the yarn with head and eyes through the complete arc from one side of the body to the other.

A pass of *Follow 180 degrees* also passes *Follow to the midline* and *Follow past midline*.

6. Regard coffee bean

With the child sitting on the caregiver's lap at the table, place a coffee bean directly in front of the child. The coffee bean should be placed on a surface that gives good contrast, such as a piece of white paper. You may point to or touch the coffee bean to attract the child's attention to it. "O"-shaped cereal may be used in place of a coffee bean.

Pass if the child clearly looks at the coffee bean.

7. Reaches

With the child sitting on the caregiver's lap so that the child's elbows are level with the table top and his/her hands are on the table, place an object such as the rattle or the red yarn within easy reach and encourage the child to pick it up.

Pass if you see the child reach toward or at least move his/her hands or arms in the direction of the object on the table.

8. Look for yarn

While the child is sitting on the caregiver's lap, hold the red yarn high and attract the child's attention to it. When the child is looking at the yarn, drop it so that it falls out of sight. Do not move your hand or arm except to release the yarn. Repeat if the child's response is unclear.

Pass if the child definitely looks for the yarn by looking down or toward the floor.

9. Rake coffee bean

With the child sitting on the caregiver's lap so that his/her elbows are level with the table top and his/her hands are on the table, drop a coffee bean to attract the child's attention.

Pass if the child picks up the coffee bean using a raking motion with the entire hand. Make sure the coffee bean did not merely stick to the child's hand but was actually picked up.

Note: This item is also passed if the child passes a *Thumb-finger grasp*.

10. Pass cube

Notice whether the child passes a block from one hand to the other. Give the child a block to encourage this; then present a second block to the same hand. The child will often pass the first block to the other hand so that he/she can take the second block.

Pass if you see the child transfer a block from one hand to the other without using his/her body, mouth, or the table.

11. Take 2 cubes

Place 2 cubes on the table in front of the child. Encourage him/her to pick up the blocks, but do not hand them to the child.

Pass if the child picks up the 2 blocks and holds one in each hand at the same time.

12. Thumb-finger grasp

(Refer to *Rake coffee bean* for administration procedure.)

Pass if the child picks up the coffee bean by bringing together any part of the thumb and one or several fingers.

A pass of *Thumb finger grasp* also passes *Rake coffee bean*.

Note: BE CAREFUL not to let the child swallow the coffee bean!

13. Bang 2 cubes held in hands (R)

Place a block in each of the child's hands and encourage him/her to bang them together. You may encourage the child to hit the blocks together by demonstrating with blocks held in your own hands. Do not touch or allow the caregiver to touch the child's hands or arms. If the child does not bang the blocks together, ask the caregiver if the child hits small objects together in this manner.

Pass if the child holds one block in each hand and hits the blocks together, or if the caregiver reports that the child hits small objects together. Pots, pans, lids, or other large objects do not pass.

14. Put the block in cup

Place 3 blocks and the cup on the table in front of the child. Encourage the child to put the blocks in the cup by demonstration and words. This demonstration may need to be repeated several times.

Pass if the child places at least one block in the cup and releases it.

15. Scribbles

Place a piece of plain paper and a pencil on the table in front of the child. You may write your name using the pencil to let the child who has never ever seen a pencil before that it is something to write with. You may place the pencil in the child's hand and encourage him/her to scribble. (Watch the child carefully and be prepared to prevent him/her from putting the pencil in mouth or eye.)

Pass if the child makes purposeful marks on the paper. Fail accidental marks or stabbing with a pencil.

16. Dump coffee bean demonstrated

Show the child 2 or 3 times how to dump the coffee bean out of the bottle. Then ask the child to get it out. (Do not use the word "dump.")

Pass if the child dumps the coffee bean out of the bottle or rakes the coffee bean close to the opening and then dumps it out. Do not pass if the child removes the coffee bean with a finger.

17. Tower of cubes – 2, 4, 6, 8

With the child sitting high enough at the table so that elbows are level with table top and hands are on the table, place the blocks on the table in front of the child. Encourage the child to stack them by demonstration and words. It may be helpful to hand the blocks to the child, one at a time. Three trials may be given.

Pass *Tower of 2 cubes* if the child puts one block on top of another so that it does not fall when he/she removes his/her hand.

Pass *Tower of 4, 6, 8 cubes*, depending upon the greatest number of blocks the child stacks in three trials.

A pass of *4, 6, or 8 cubes* also passes the lower tower items (for example, passing *Tower of 6 cubes* also passes *Tower of 2 and 4 cubes*).

18. Imitate vertical line

The child should be seated at the table at a comfortable writing level. Place a pencil and a piece of plain paper in front of the child and tell him/her to draw lines like yours. On that paper, demonstrate how to draw vertical lines, drawing toward the child. Do not guide the child's hand. Three trials may be given.

Pass if the child makes 1 line or more on the paper, at least 2 inches long, and not varying from your vertical line by more than 30 degrees (see example). Lines do not have to be perfectly straight.

19. Thumb wiggle

Demonstrate with one or both hands by making a fist with your thumb pointing upward. Wiggle only your thumb. Tell the child to wiggle his/her thumb (or thumbs) the same way. Do not help put the child's hand into position. You may tell the child to make a "thumbing".

Pass if the child moves the thumb of either or both hands without moving any other fingers.

20. Copy O

Give the child a pencil and a piece of plain paper. Show him/her the circle on the back of the test form. You may show how to hold a pencil. If necessary, demonstrate how the pencil works by *Writing down your name. Tell the child to "draw one like the picture" without naming it or moving your finger or pencil to show how to draw it. Three trials may be given.*

Pass any form approximating a circle that is closed or nearly closed. Fail continuous spiral motions.

21. Draw person – 3 parts, 6 parts

Give the child a pencil and a piece of plain paper. You may show how to hold a pencil. If necessary, demonstrate how the pencil works by writing down your name. Tell him/her to draw a picture of a person (boy, girl, Mommy, Daddy, etc.). Be sure the child has finished before scoring the drawing.

3 Parts– Pass if the child has drawn 3 or more body parts. A pair (ears, eyes, arms, hands, legs, feet) is considered one part. To get credit, both parts of the pair must be drawn unless the drawing is in profile (in which case one eye, ear, etc., gets credit). Make a note in your test observations of any unusual drawing, even though the child has identified the acceptable parts.

6 Parts – Pass if the child has drawn 6 or more body parts. (See criteria under 3 parts.)

A pass of *Draw person – 6 Parts* also passes *Draw person – 3 Parts*.

22. Copy +

Give the child a pencil and a piece of plain paper. Show him/her the cross on the back of the test form. You may show how to hold a pencil. If necessary, demonstrate how the pencil works by writing down your name. Tell the child to "draw one like the picture" without naming it or moving your finger or pencil to show how to draw it. Three trials may be given.

Pass if the child draws 2 lines which intersect at least somewhat near the midpoint. The lines do not need to be exactly straight, but the intersecting lines do need to be drawn using only 2 strokes.

23. Pick longer line

Making sure they are presented vertically, show the child the parallel lines on the back of the test form and ask the child "which line is longer?" (do not say "bigger"). After the child has pointed to a line, turn the paper upside down and ask the question again. Turn the paper upside down again and repeat this a third time. If the child does not answer correctly all three times, repeat the question three more times, turning the paper each time.

Pass if the child picks the longer line 3 out of 3 times, or 5 out of 6 times.

24. *Copy* □□

Note: Administer *Copy* □□before *Copy* □□*Demonstrated*.

Give the child a pencil and a piece of plain paper. You may show how to hold a pencil. If necessary, demonstrate how the pencil works by writing down your name. Show him/her the

square on the back of the test form. Tell the child to “draw one like the picture” without naming it or moving your finger or pencil to show how to draw it. Three trials may be given.

Pass if the child draws a figure with straight lines and 4 square corners. The corners may be formed by lines that intersect but the corners must be approximately right angles (not rounded or pointed). The length should be less than 2 times the width.

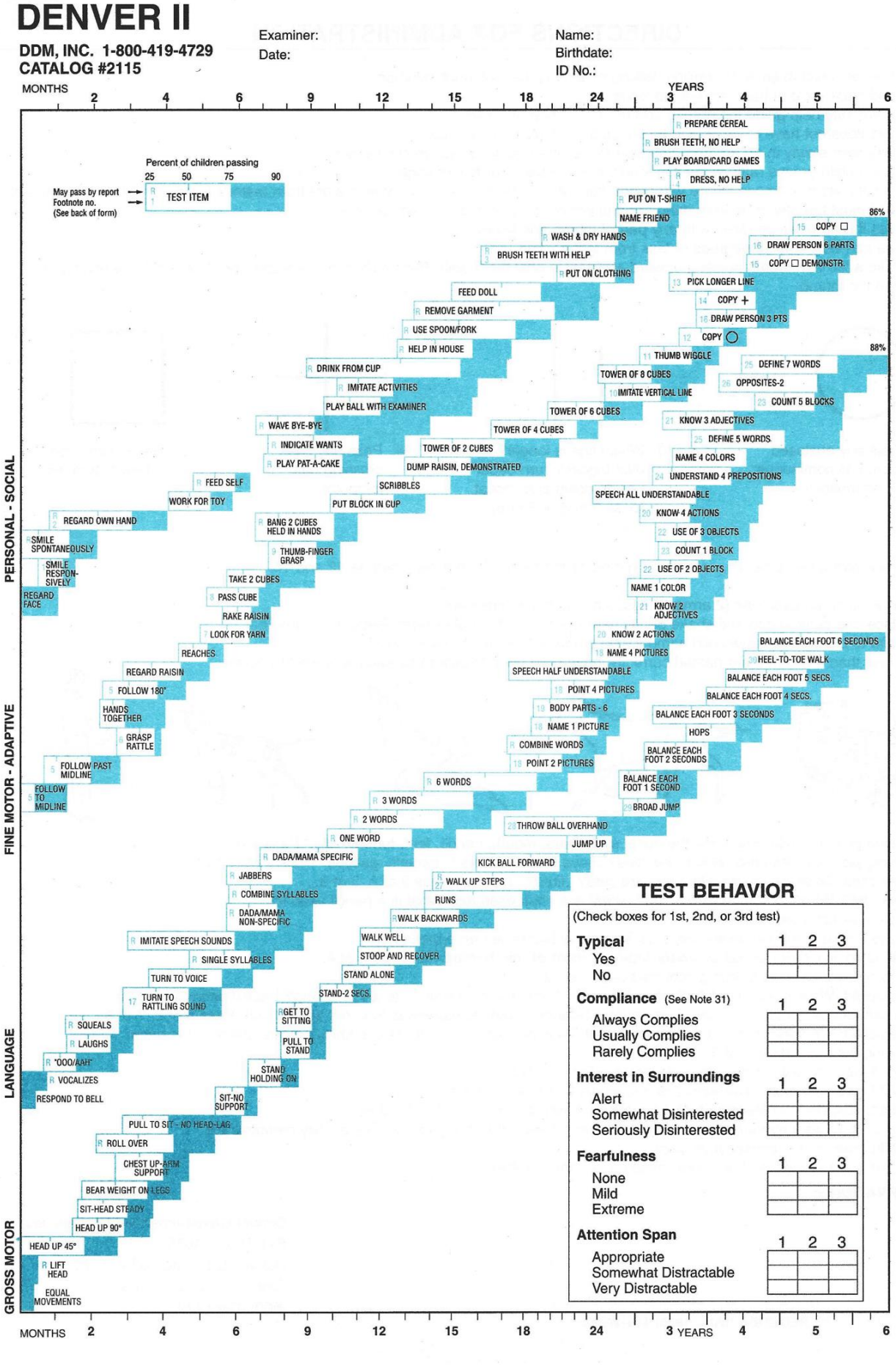
A pass of *Copy* □□also passes *Copy* □□*Demonstrated*.

25. Copy □□Demonstrated

If the child is unable to copy the square from the picture, show him/her how to draw it by drawing two opposite (parallel) sides first and then the other two opposite sides (rather than drawing the square with a continuous motion). Three demonstrations and trials may be given.

Pass by the same criteria as *Copy*.

Denver chart



ህብረተሰብ ጤና ሳይንስ ኮሌጅ

የመጠየቂያ/መረጃቅፅ /

Annex 4: Amharic version of information sheet

ጤና ይስጥልኝ፤ ስሜ_____ይባላል፡፡ የመጣሁት በአዲስ አበባ ዩኒቨርስቲ ህብረተሰብ ጤና ሳይንስ ተማሪ የሆነችውን ረድኤት ቨፈራው ወክዬነው፡፡ የሁለተኛድግሪ መመረቂያ ጥናቷን የምትሰራው የእናት ጡት ማጥባት ልምድን መሰረት ያደረገ እና ህፃናት ዕድገት ለማጥናት በተመለከተ ነው፡፡ ጥናቱን ለማድረግ ከአዲስ አበባ ዩኒቨርሲቲና ጤና ቢሮ ፈቃድ አግኝታለች፡፡

እርስዎ የተመረጡት በዚህ አካባቢ ነዋሪና እድሜው ከ20 ወር እስከ 24ወር የሆነ ህፃን ልጅ እናት ስለሆኑ ነው፡፡ በጥናቱ ላይ መሳተፍ ሙሉ በሙሉ በርስዎ ፈቃድ ላይ የተመሰረተ ነው፡፡ መጠይቁ የተለያዩ ክፍሎችን ያካተተ ሲሆን ስለራስዎ፤የልጅዎ አወላለድ እንዲሁም የጡት ማጥባት ልምድዎ እንዲሁም ስለ ልጅዎ እድገት እንጠይቆታለን፡፡ ቃለ መጠይቁ ወደ 30 ደቂቃ የሚፈጅ ይሆናል፡፡ በጥናቱ የመሳተፍ ወይም አለመሳተፍ ሙሉ መብት አለዎት አንዲሁም ለመሳተፍ ፈቃደኛ ከሆኑ በኃላ በፈለጉት ጊዜ ማቋረጥ ወይም ማቆም ይችላሉ ፡፡ ይህም በጥናቱ አለመሳተፍ የሚደርስቦ ጉዳት የለም፡፡

ከዚህ ጥናት የተሰበሰበው መረጃ ሙሉ በሙሉሚስጥራዊነቱ የተጠበቀ ይደረጋል፡፡ ከጥናት ቡድኑ ውጪ ማንም የተሰበሰበውን መረጃ ማግኘት አይችልም፡፡እንዲሁም መረጃው ከጥናቱ አላማ ውጪ ለምንም አንጠቀምበትም፡፡

በጥናቱ በመሳተፍዎ ለልጅዎ የተሟላ ጤንነት አጅጉን አስፈላጊና ጠቃሚ ስለሆነው ተገቢ የአመጋገብ ስረአቶች ልምድ ይማራሉ፡፡ በተጨማሪም ጥናቱ ለጡት ማትባት ልምድ ተገቢ የሆነው ትኩረት እንዲሰጠው ጥናቱ ጥሩ ሚና ይኖርዋል፡፡ የእርስዎ ፈቃደኝነትና የነቃ ተሳትፎ ለዚህ ጥናት ስኬታማነት አስፈላጊ ነው፡፡

ስለጥናቱጥያቄወይምተጨማሪመረጃከፈለጉበዚህአደራሻመጠየቅይችላሉ፡፡

ስም፡- ረድኤት ቨፈራው

ስልክቁጥር፡-0932150898

ኢሜል፡-redshf@gmail.com

Annex 5 Amharic version of informed consent

<u>የስምምነትመጠየቂያ/ማረጋገጫቅፅ</u>

ከላይ በተሰጡት መረጃ መሰረት በዚህ ጥናት ለመሳተፍ ፈቃደኛ ኖት

1 አዎ (ቃለመጠይቁ ይቀጥል)

2 አይደለሁም (አመስግነህ ወደሚቀጥለው ተሳታፊ እለፍ)

የተሳታፊው ፊርማ_____ቀን_____

ቃለመጠይቅ አድራጊው ስም_____ፊርማ_____

ቁጥር_____

የቃለመጠይቅ የተካሄደበት ቀን_____የተጀመረበት ሰዓት_____ያለቀበት ሰዓት

መጠይቁ ታይቷል/ ተፈትሿል_____

የቃለ መጠይቁ ውጤት፡ 1. ሙሉ በሙሉ የተሟላ

2. ያልተገኙ

3.ፍቃደኛ ያልሆኑ

4. በከፊል የተሟላ

በተቆጣጣሪዎች ተረጋግጧል ፤ስም_____ፊርማ_____

Annex 6: Amharic version of questionnaire

መለያ

ቁጥር_____ ቀጠና_____ቀበሌ_____

የተሳታፊው/ የመላሹስም_____የቤት ቁጥር_____

ተሳታፊውከህጻኑጋርያላቸውግንኙነት ወላጅ----------1

አያት----------2

ወንድም/እህት--------3

የልጁ ተንከባካቢ --------4

የጠያቂውስም_____ የመጠይቁቀን_____

የተጀመረበትሰአት_____ ያለቀበትሰአት_____

ክፍልአንድ፤ አጠቃላይ የእናትና የኑሮ ሁኔታ

ኣሁን ስለራስዎና ስለቤተሰብዎ የኑሮ ሁኔታ ኣስመሌክቶ የተወሰኑ ጥያቄዎችን እጠይቆታለዉ።።

ቁጥር	ጥያቄ		
101	ከልጁ ጋር ያሎት ዝምድና ምን ነው	እናት ……..……1 ተንከባካቢ……..……2	
102	እዴሜ(በአመት)	_____ አመት	
103	ሀይማኖቶት ምንድን ነው?	ሙስሉም…….……1 ኦርቶድክስ…….……2 ፕሮቴስታንት…… ……..…3 ካቶሉክ……..4 ሌላ(_____)	
104	የጋብቸዎት ሁኔታ ምን ይመስላሌ?	ያገባች……1 ያለገባች……2 የተለየች……3 የፊታች……..……4 የሞተባት……..……5	
105	ልጁን በዋናንት የሚንከባከበው ማነው	1.እናት ……1 2. አባት……..…2 3. አያቶች……..…3 4. ወንድም/እህት……4 5. የህፃኑ ተንከባካቢ……5	መልሱ 1፣2 ከሆነ ወደ 108 ይሂዱ
106	የልጁ ተንከባካቢ ትምህርት ተምረው ያውቃሉ?	አዎ…….……1 አይ…….……2	መልሱ አይ ከሆነ ወደ 108 ይሂዱ
107	የትምርቶት ሁኔታ ምን	ያሌተማሬች……1	

	ይመስላል?	ማምበብናማፃፍ……..…2 የመጀመሪያ ደረጃት/ቤት (1 8)……..…3 የሁለተኛደረጃና መሰናድ ት/ቤት(9_12)....4 ሙያ ስልጠና……..……5 ኮላጅና ከዛ በሊይ……..…6	
108	የልጁ እናት ትምህርት ተምረው ያውቃሉ?	አዎ……..……1 አይ……..…….....2	መልሱ አይ ከሆነ ወደ 110 ይሂዱ
109	የትምርቶት ሁኔታ ምን ይመስላል?	ያሌተማሬች……1 ማምበብናማፃፍ……..…2 የመጀመሪያ ደረጃት/ቤት (1 8)……..…3 የሁለተኛደረጃና መሰናድ ት/ቤት(9_12)....4 ሙያ ስልጠና……..……5 ኮላጅና ከዛ በሊይ……..…6	
110	የልጁ እናት ስራ ምንድን ነዉ?	የቤት እመቤት……..…1 ገበሬ……..…2 ተቀጣሪ……..……..……..…3 ነጋዳ ……..……..4 የአከባቢዉን መጠጥ የምትሸጥ……...5 ተማሪ……..…6 የግሌ ስራ……..…7 ስራ አጥ……..……8 ላሊ(ግሇፅ)_____	
111	የልጅ ዎ አባት ትምህርት ተምረዋል?	አዎ……..……1 አይ……..…….....2	መልሱ አይ ከሆነ ወደ 113 ይሂዱ
112	የትምርቶት ሁኔታ ምን ይመስላል?	ያሌተማሬች……1 ማምበብናማፃፍ……..…2 የመጀመሪያ ደረጃት/ቤት (1 8)……..…3	

		የሁለተኛደረጃና መሰናድ ት/ቤት(9_12)....4 መ.ያ ስልጠና……..……5 ኮላጅና ከዛ በሊይ……..…6	
113	የቤተሰብ ብዛት (በቤትዎዉስጥየምኖሩየሰዎ ችብዛትምንያህሌይሆናሌ?)	ቁጥር _____	
114	የመኖርያአከባቢ	ከተማ……1 ገጠር……..2	
115	የመኖርያቤትይዞታ	የግሌ……..…..1 የቀበላ……..…..2 ኪራይ……3 የዘመዴ/የላላ ሰዉ……4 ላሊ(ግሇፅ)_____	
116	ውሃ ከየት ነው ምትቀዱት	1. የቧንቧ ውሃ……..…1 2. የተጠበቀ ምንጭ……..…2 3. ያልተጠበቀ ምንጭ……..……3 4. የተጠበቀ የጉድጓድ ውሃ……4 5. ያልተጠበቀ ጉድጓድ ውሃ…….5 6. ሀይቅ……6 7. ወንዝ……7 8. ኩሬ……8 9. ላላካለይገለጽ	
117	ውሃ ለመቅዳት ምን ያህል ጊዜ ይፈጅብሻል	ደቂቃ_____	
118	የምትጠቀሙትየመጸዳጃአይነት?	1. የሚሰራበውሃየሚወረድመጸዳጃቤት...1 2. የማይሰራበውሃየሚወርድመጸዳጃቤ....2 3. የሚሰራየጉድጓድመጸዳጃ……..…..3	

		4. የማይሰራየጉድጓድመጸዳጃቤት.....4 5. ሜዳላይ.....5 6. ሌላካለይጠቀስ	
119	ለማብሰያ የምትጠቀሙት የትኛውን ነው?	1. ኤሌክትሪክ.....1 2. ጋዝ.....2 3. ከሰል.....3 4. እንጨት.....4 5. የጸሀይብርሃን.....5 6. ኩበት.....6 7. ሌላካለይጠቀስ_____	
120	ከሚከተሉት ውስጥ በቤት ውስጥ የሚገኘው የትኛው ነው?	አለ	የለም
	- ኤሌክትሪክ	1	2
	- ሬዲዮ	1	2
	- ቴሌቪዥን	1	2
	- ሞባይል	1	2
	- ፍሪጅ	1	2
	- ሰአት(የግድግዳ)	1	2
	- ጠረጴዛ	1	2
	- ወንበር	1	2
	- አልጋ	1	2

	- የኤሌክትሪክምጣድ	1	2
	- ጋዝ	1	2
121	ከሚከተሉት ውስጥ በቤት ውስጥ የሚገኘው የትኛው ነው?	1	2
	- መኪና	1	2
	- ሞተር	1	2
	- ሳይክል	1	2
	- ጋሪ	1	2
122	በቤትውስጥከብቶችአላችሁ	1. አሥ.....1 2. የለም.....2	የለምከሆነወደ ጥያቄቁጥር 121 ይሂዱ
123	ከሚከተተሉት ውስጥ ቤተሰቡ ስንት የቤት እንስሳት አሉት?	በቁጥር	
	- ላም	|__|__|	
	- በሬ/ከብት	|__|__|	
	- ፈረስ/አህያ/በቅሎ	|__|__|	
	- በግ	|__|__|	
	- ፍየል	|__|__|	
	- ዶሮ	|__|__|	

	- የንብቀፎ	|__|__|	
124	የእርሻ መሬት አላችሁ?	1. አለን……..…1 2. የለንም……..2	የለንም ከሆነ ወደ ጥያቄ ቁጥር 123 ይሂዱ
125	ምን ያህል መደብ መሬት ነው ያላችሁ?	----------	
126	የቤቱ ጣሪያ የተሰራው ከምንድን ነው?	1. ቀርከሃ/ሸንበቆ/ሣር……...1 2. ቆርቆሮ……...2 3. ጣዉለ……3 4. ፕላስቲክ……..……4 5. ስምንቶ/አምነበረዬ……5 6. ሌላ(ይጥቀስ)_____	
127	መሬቱ ከምንድን ነው የተሰራው?	1. አፈር……..…1 2. ጣውላ……2 3. ሲሚንቶ……3 4. ሴራሚክ (ሸክላ) ……..…4 5. ስጋጃ (ምንጣፍ) ……5 6.ሌላ ካለ ይገለፅ _____	
128	የቤቱ ግድግዳ የተሰራበት ዋነኛ የግንባታ ቁሳቁስ ምንድነው?	1. እንጨትና ጭቃ……1 2. እንጨት ጭራሮና ሳር……2 3. ድንጋይና ሲሚንቶ……..3 4. ብሎኬት……..4 5. ቆርቆሮ……5 6. ሌላይገለጽ_____	

ክፍል 2 የሕጻኑመረጃ

አሁን ስለ ልጅ ዎ እጠይቆታለሁ

ቁጥር	ጥያቄ		
201	የህጻኑ ስም		
202	ጾታ	1. ወንድ 2. ሴት	
203	ህጻኑ የተወለደበት ቀን (ቀን/ወር/ዓ.ም)	___/___/_____	
204	የህጻኑ እድሜ በወራት		
205	ህጻኑ ስንተና ልፀ ነው?		

ክፍል 3 ስለ ወሊድ እና ጡት ማጥባት ልምድ

አሁን ደግሞ ስለወሊድ እና የጡት ማጥባት ልምድሽ እጠይቅሻለሁ

ቁጥር	ጥያቄ		
301	ልጅሽንየትነውየተገላገልሽው/የወለድሽው	1. ቤትውስጥ……1 2. በጤናተቋም……2 3. ወደጤናተቋምበመሄድላይ……3	
302	(የህጻኑስም) እንዴትነበርየተገላገሽው	1. በተፈጥሮመንገድ……1 2. በመሳሪያበመታገዝበተፈጥሮመንገድ ……2 3. በቀዶጥገና……..3	
303	(የህጻኑ/ኗስም) ጡትአጠብተሽውታውቂያለሽ	1. አዎ……..1 2. አይ……..2	አይ/አላወቅም ከሆነወደጥያቄቁጥር 306

		3. አላወቅም……98	ይሂዱ
304	ከወለድሽበምንያህልሰአትውስጥ ጡትሰጠሽው/አጠባሽው	1. ወዲያው(በአንድሰአትውስጥ)…….1 2. ከ1-23 ሰዓትውስጥ…….....2 3. ከ24ሰዓት/ 1 ቀንበኋላ…….3 4. አላውቅም……98	
305	የመጀሪያውንቢጫወተት(እንገር) ሰጥተሽዋል	1. አዎ……1 2. አይ……2 3. አላውቅም……98	
306	ህጻኑ/ኗበተወለደ/ችበሶስት(3) ቀናትውስጥከጡትሌላየሰጠሽው ነገርአለ	1. አዎ……1 2. አይ……2	አይከሆነወደ ጥያቄቁጥር 308ይሂዱ
307	ምንነበርለህጻኑ/ኗየሰጠሽው	1. ወተት/ከጡትውጪ……1 2. ውሃ……2 3. በስኳርየተበጠበጠውሃ……3 4. በስኳር እና ጨው የተበጠበጠ ውሃ..4 5. የፍራፍሬጭማቂ……5 6. ፎረሙላ/የቆርቆሮወተት……6 7. ሻይ……7 8. ማር……8 9. ቅቤ……9 ላካለይጠቀስ_____	
308	ለምን ያህል ጊዜ ነው ጡት ብቻ የጠባው?(ሌላ የጣሳ ወተት ወይም ምግብ ሳይጨመር)	የወራት ብዛት _____	

309	በአሁኑ ሰዓት ልጅ ጡት እየጠባ ነው?	አዎ…….. 1 አይ……...2 አያውቅም……..98	አይከሆነወደ ጥያቄቁጥር 310ይሂዱ
310	ልጅ ዕድሜው ስንት ሲሆን ነው ጡት መጥባት ያቆመው	የወራት ብዛት _____	
311	ልጅ ዕድሜው ስንት ሲሆን ደረቅ ና ለስላሳ ምግብ መመገብ የጀመረው?	የወራት ብዛት _____	

ክፍል 4፡ ዲጻሬ

ማስታወሻ

ልጁ ከመነሳቱ ጀምሮ ቀኑን ሙሉ እና በማታ የነበረውን እንቅስቃሴ እና የበላወን ምግበ በመሰማት ይመዝግቡ

ቁጥር	ጥያቄ				
401	ልጅሽ ባለፉት 24 ሰዓታት ውስጥ ቀንና ማታ ጡት ጠብቶ ነበር	1. አዎ……1 2. አይ……2 3. አላውቅም…98			
402	ልጅሽ በትናንትናው ዕለት ቀንና ማታ ለወስዳቸው የሚችላቸውን ፈሳሽ (ከአንድ በላይ መልስ መስጠት ይቻላል)	አዎ	አይ	አላውቅም	
	1. ውሃ	1	2	3	

	2. ፎርሙላ/የቆርቆሮ ወተት	1	2	3	
	3. የላም ወተት	1	2	3	
	4. ፍራፍሬ ጭማቂ	1	2	3	
	5. እርጎ	1	2	3	
	6. ቀጠን ያለ ገንፎ	1	2	3	
	7. ሻይ/ቡና በወተት	1	2	3	
	8. ሌላ ካለ ይጠቀስ _____	1	2	3	
403	በትናንትናውዕለትቀን/ማታየትኛውንምግብ ወስዷል	አዎ	አይ	አላውቅም	
1	ገንፎ; ዳቦ; ሩዝወይምከጥራጥሬየተሰሩሌሎችምግቦች	1	2	3	
2	ዱባ; ካሮት; ስኳርድንች(ውስጡ ቢጫ)	1	2	3	
3	ቡላ; ድንችወይምከስራስርየተዘጋጀምግቦች	1	2	3	
4	አረንጎዴ ጎመንአትክልቶች	1	2	3	
5	የበሰለ ማንጎ፤ፓፓዬ	1	2	3	
6	ለላ ማንኛወም አይነት አታክልት እና ፍራፍሬ				
7	ጉበት፤ኩላሊት፤ልብ	1	2	3	
8	ስጋ፣የላም፣የበሬ፣የፍየል፣የዶሮ	1	2	3	
9	እንቁላል	1	2	3	

10	አሳ	1	2	3	
11	ባቄላ፣ምስር፣አቾሎኒ፣	1	2	3	
12	እርጎ፣የወተት ተዋፅኦዎች	1	2	3	
13	ዘይተ፣ቅቤ ከእነዚህ የተሰሩ ምግቦች	1	2	3	
14	ቾኮላት፣ጣፋጭ፣ ከረሜላ	1	2	3	
15	የታሸጉየህጻናትምግቦች	1	2	3	
16	እንጀራ/ቂጣወይምሌላከጤፍየተዘጋጁምግቦች	1	2	3	

አሁን ደግሞ ልጅሽ በትናንትናው ዕለት ቀንና ማታ ሊወስዳቸው የሚችላቸውን ፈሳሽ ወይም ደረቅ ምግብበተመለከተ እጠይቅሻለሁ፡፡ (ከአንድ በላይ መልስ መስጠት ይቻላል)

404	**በትናንትናውዕለትቀን/ማታ ምግብወስዷል** **ምን አይነት ምግብወስዷል?**	1. **አዎ**.....1 2. **አይ**.....2 3. □□□□□...98	**አዎ ከሆን ውደ** 403 **ተመልሰወ የበላቸውን ይመዝግቡ** **አይ ከሆነ ወደ** 405 **ይሂዱ**
405	**ልጅሽ በትናንትናው ዕለት ቀንና ማታ ፈሳሽ ነገሮችወስዷል**?	1. **አዎ**.....1 2. **አይ**.....2 3. **አላውቅም**...98	

ክፍል 5፤ የሰውነት መጠን ልኬት

ቁጥር	የሰውነት መጠን ልኬት	
501	የህጻኑ ስምና የመለያ ቁጥር	ስም
502	የህፃኑን ክብደት የለካው ባለሙያ ባነበበው መሰረት መጻፍ የህፃኑን ክብደት ለለካው ሰው የጻፍነውን መልሰን መናገር ትክክለኝነቱን ማረጋገጥ	ኪሎ ግራም(ኪ.ግ).. ☐☐☐ ☐☐ ልጁ አልነበረም.....1 ልጁ ፈቃደኛ አልሆነም.....2 ተንከባካቢው ፈቃደኛ አልሆነም.....3 ሌላ ካለ ይጥቀሱ.....4
503	ህፃኑን ልብሱን ቀንሶ ስስ ልብስ ለብሷል	አዎ.....1 አይደለም የልጁን ልብስ መቀነስ አልተቻለም.....2
504	ህፃኑ ከሁለት ዓመት በታች ከሆነ ቁመቱ ሲለካ ተኝቶ መሆን አለበት ህፃኑን የለካው ሰው ባነበበው መሰረት መፃፍ የህፃኑን ክብደት ለለካው ሰው የጻፍነውን መልሰን መናገር ትክክለኝነቱን ማረጋገጥ	ቁመት/ርዝመት (ሴ.ሚ ☐☐☐ ☐☐ ልጁ አልነበረም.....1 ልጁ ፈቃደኛ አልሆነም.....2 ተንከባካቢው ፈቃደኛ አልሆነም.....3 ሌላ ካለ ይጥቀሱ.....4
505	ህፃኑ የተለካው ተኝቶ ነው ወይስ ቆሞ?	ተኝቶ.....1 ቆሞ.....2
	ህፃኑን ስለትብብሩ በማመስገንና ለአስተባባሪው በማሳወቅ ወደ ሚቀጥለው ጥያቄ ሂድ	

ክፍል 6፤ <u>የቤት ውስጥ ጥናት -ግምገማ እና ቃለ መጠይቅ (ማሻሻልን በተመለከተ)</u>

የእናት /የልጅ መለያ _____ የልጅ ጾታ _____ ቀን፡--_____

መንደር_____ ቃለ መጠይቅ አድራጊ _____

ቃለመጠይቁ ዘና ባለ ሁኔታ፣ ያለምንም ቅድመ ድምዳሜ እና ወዳጃዊ በሆነ መንገድ የሚደረግ ነው፡፡ የእናት -ልጅ ግንኙነትን በተመለከተ ግምገማ በሚያደርጉበት ጊዜ ከእናትየው ጋር ይነጋገሩ፡፡ በሚችሉበት ጊዜ ሊገመግሟቸው ያልቻሏቸውን ጉዳይ በተመለከተ ጥያቄ ያቅርቡ፡፡ ልጁ/ልጅቷ እየተንቀሳቀሰ/እየተንቀሳቀሰች ባለበት ወይም ባለችበት ቦታ እንደሆኑ ቃለ ምልልሱ መደረግ አለበት፡፡

ቁጥር	1. ምላሽ ሰጪነት (ግምገማ)	አዎን ወይም የለም የሚለው ላይ ያክብቡ	
601.	እናትየው ከልጇ ጋር በመደበኝነት ታወራለች	0,1= የለም	2+= አዎን
602.	ልጁ/ልጅቷ በምታወራበት ወቅት እናትየው የቃላት ምላሽ ትሰጣለች (አትቆጣም/አታላግጥበትም ወይም መልስ ላለመስጠት ዝም አትልም	የለም	አዎን
603.	እናትየው በጉብኝነት ወቅት የነገሮችን ወይም የሰዎችን ስም ለልጇ ትነግራለች	የለም	አዎን
604.	እናትየው ንግግር ለመረዳት የሚቻል፣ ግልጽ እና የሚሰማ ነው	የለም	አዎን
605.	እናትየው ከቃለመጠይቅ አድራጊው ጋር ስለማንኛውም ነገር ለመነጋገር ዝግጁ ነች (ለሚያቀርቡት ጥያቄ ብቻ መልስ አትሰጥም)	የለም	አዎን
606.	እናትየው ከቃለ መጠይቅ አድራጊው ጋር በአግባቡ እና በነፃነት ትነጋገራለች	የለም	አዎን
607.	እናትየው/ልጁ/ልጅቷ በነፃነት እንዲጫወቱ ትፈቅዳለች (ነገሮችን ማተራመስ እና ጩኸትን ጨምሮ)	የለም	አዎን

608.	እናትየው በመደበኝነት ልጇን ታደንቃለች ወይም ታበረታታለች	0,1 ጊዜ = የለም	2+= አዎን
609.	የእናትየው ድምጽ በልጁ ላይ አዎንታዊ ስሜት እንዲፈጠርበት ያደርጋል	የለም	አዎን
610.	እናትየው ልጇን ታቅፋለች፣ እራሱን ትዳብሰዋለች ወይም ትስመዋለች	የለም	አዎን
611.	ቃለ መጠይቅ አቅራቢው አድንቆት በሚሰጥበት ጊዜ እናት እና ልጅ አዎንታዊ በሆነ መንገድ ምላሽ ይሰጣሉ (ለምሳሌ እናትየው ጭንቅላቷን በመነቅነቅ፣ ፈገግ በማለት፣ በማመስገን እና በመስማማት	የለም	አዎን
612.	ቃለ መጠይቁ በሚደረግበት ወቀት እናትየው ልጁ/ልጅቷ የሚጫወቱበትን እቃዎች ለማቅረብ ጥረት ታደርጋለች	የለም	አዎን
2. ተቀባይነት			
613.	እናትየው በልጇ ላይ ትጮሀለች	የለም፤ ተቃራኒ ውጤት	አዎን
614.	እናትየው በልጇ ላይ ቅሬታ ታቀርባለች ወይም ልጁ/ልጅቷ መጥፎ እንደሆነ ወይም እንደሆነች ትናገራለች	የለም	አዎን
615.	በቃለ መጠይቁ ወቅት እናትየው ልጇን ትመታለች፣ ትገፈትራለች፣ ወይም ይዛ ትንጠዋለች	የለም	አዎን
616.	(ያጠሩ ልጅዎን የሚቀጡት ምን አይነት ቅጣት ነው? አካላዊ ቅጣት፤ ምግብ መከልከል) ባለፈው ሳምንት ልጅዎን ስነ-ስርዓት ለማስያዝ መትተውታል ወይም ይዘው ንጠውታል? (ስለሁኔታው ይጠይቁ)	0,1 ጊዜ = የለም	አዎን
617.	ቃለ መጠይቁ በተደረገበት ወቅት እናትየው ልጁን እንደምትቀጣው ታስፈራራዋለች ወይም ትነቅፈዋለች	የለም	አዎን

618.	ቃለ መጠይቁ በተደረገበት ወቅት እናትየው ልጁ የሚያደርገው እንቅስቃሴ ታግደዋልች ወይም ጣልቃ ትገባበታለች	የለም	1,2,3 አዎን
619.	በቤቱ ውስጥ ቢያንስ ሶስት ለአዋቂዎች የሚሆኑ መፃሕፍት ወይም መጽሄቶች ይገኛሉ (የትምህርት መፃሕፍትን ሳይጨምር ነገር ግን ሀይማኖታዊ መፃሕፍትን ጨምሮ	የለም	አዎን
620.	ክልጅዎ ጋር አብሮ የሚጫወት ሌላ ልጅ ወይም የጫወታ አጋር አለን?	የለም	አዎን
3. አደረጃጀት			
621.	እርስዎ በማይኖሩበት ጊዜ ልጅዎን በመደበኝነት የሚንከባከበው ማነው?	3+	ኤምኦ1,2
622.	ልጅዎ ወደ ገበያ ይሄዳልን? ለምን ያህል ተደጋጋሚ ጊዜያት	በጣም አልፎ አልፎ	በየሳምንቱ
623.	ልጅዎ ለምን ያህል ተደጋጋሚ ጊዜያት ከቤት ይወጣል	<4	4+ በየሳምንቱ
624.	ልጅዎ ለሽርሽር ከመንደሩ ለምን ያህል ተደጋጋሚ ጊዜያት ይወጣል?		በየአመቱ
625.	ልጅዎ የሚጫወትባቸውን ነገሮች የሚያስቀምጥበት ቦታ አለን? (ቦርሳ፣ ሳጥን)	የለም	አዎን
626.	በቤት ውስጥ የሚገኝ/ከቤት ውጪ የሚገኝ የመጫወቻ ቦታ ደህንነቱ የተጠበቀ እና ብሩህ መሆኑን ይመልከቱ	የለም	አዎን
4. የትምህርት መሳሪያዎች “እባክዎን ልጅዎ በየእለቱ በራሱ ምን እንደሚጫወት ያሳዩኝ”			
627.	የተለያዩ የመጫወቻ ችቃዎች፤ ለምሳሌ ኪስ፣ ገመድ፣ ቀለበት፣ ጠፍጣፋ ድንጋይ	የለም	አዎን
628.	የሚገፉ ወይም የሚጎተቱ አሻንጉሊቶች፤ ለምሳሌ በገመድ	የለም	አዎን

	የሚጎተቱ እና የሚገፉ ሳጥኖች		
629.	ጎማ ያላቸው ማንኛውም የመጫወቻ አሻንጉሊቶች	የለም	አዎን
630.	ድራማዊ የሆነ ነገር የሚፈጥሩ የመጫወቻ እቃዎች፤ ለምሳሌ አሻንጉሊቶች፣ ትራንስፖርት፣ የቤት ውስጥ እቃዎች	የለም	አዎን
631.	በቀላሉ ከዓይን እና ከእጅ ጋር በተጣጣመ መንገድ የሚሰሩ ማቴሪያሎች (የሚነዝር፣ የሚንኮሻኮሽ ወይም የሚዘረጋ እና የሚተጣጠፍ እቃ	የለም	አዎን
632.	ውስብስብ የዓይን እና የእጅ ቅንጅትን የሚጠይቁ ማቴሪያሎች (ለምሳሌ የተለያየ ቅርጽ ያላቸው ብሎኮች፤ እርሳስ እና ወረቀት)	የለም	አዎን
633.	የስዕል መፃሕፍት (የመማሪያ መፃሕፍት ያልሆኑ፤ ነገር ግን የስዕል ስብስቦች ሊሆኑ ይችላሉ)	የለም	አዎን
634.	እናትየው ለልጁ በጥቂቱ ሊከብዱ የሚችሉ ማቴሪያሎችን ታቀርባለች፡፡ ለምሳሌ ----------	የለም	አዎን
635.	ልጅዎ ከሰዎች ጋር የተዋቀሩ ጫወታዎችን ይጫወታልን? (ለምሳሌ ክብ በመስራት የሚደረግ ጫወታ፣ በማጨብጨብ /በመዝፈን የሚደረጉ ጫወታዎች)	የለም	አዎን
5. ተሳትፎ			
636.	እናትየው አብዛኛውን ጊዜ ልጇን በዓይኗ ትከታተላለች	የለም	አዎን
637.	በቤት ውስጥ ስራ በሚበዛብዎት ጊዜ ከልጅዎ ጋር ይነጋገራሉን?	የለም/ አንዳንድ ጊዜ	ዘወትር
638.	ባለፈው ሳምንት ለልጅዎ አዲስ ነገር አሳይተዋል ወይም አስተምረዋልን? ለምሳሌ አዲስ ቃል ወይም ደግሞ ልጁን /ልጅቷን አስቸጋሪ ነገሮችን ሲያከናወኑ መርዳት	የለም	አዎን
639.	ልጅዎ የሚጫወትበት አዲስ ነገር አግኝተዋል/ሰርተዋልን? አዲሱን	የለም	ባለፈው

	አሻንጉሊት የሰጡት መቼ ነው?		ወር
640.	ባለፈው ሳምንት ከልጅዎ ጋር ሆነው በመፃሕፍት ወይም በካሌንደር ወይም በመፅሔቶች ውስጥ የሚገኙ ምስሎችን አይተዋልን?	የለም	በየቀኑ
6. ልዩ ልዩ			
641.	አባትየው ከልጁ ጋር በማውራት፣ የእግር ጉዞ በማድረግ እና በመጫወት ምን ያህል ተከታታይ ጊዜ ያሳልፋል	የለም	በየቀኑ
642.	ለልጅዎ ለመጨረሻ ጊዜ ተረት ያወሩለት መቼ ነበር?	በጣም አልፎ አልፎ	በየሳምንቱ
643.	ልጅዎ ከሁሉም የቤተሰብ አባላት ጋር ተቀምጦ እራት ይመገባልን?	የለም	አዎን
644.	በቤትዎ እንግዶችን ይቀበላሉን ወይም ዘመዶችን ይጎበኛሉኝ? መልስዎ አዎን ከሆነ ለምን ያህል ተከታታይ ጊዜ	የለም	በየወሩ
645.	ልጅዎ ፎቶግራፎች አሉትን? ሶስት ወይም ከዚያ በላይ የሆኑ የፎቶግራፍ አልበሞች	የለም	አዎን 3+

ዴንቨር 2

እያንዳንዱን መጠይቅ ለመፈተን (የሚረዳ) መመሪያ

በዝርዝር የተገለጹትን ቅደም ተከተሎች በትክክል እየተከተልክ ህጻኑን አንድ መጠይቅ ወይም ከመተውህ በፊት የነጥብ መመዝገቢያ መስፈርቱን በጥንቃቄ አንብበህ መረዳትህን አረጋግጥ። በተንከባካቢው የቀረቡ ዘገባ መሰረት አንድንድ መጠይቆች ሊታለፉ ይችላሉ።። እነዚህ መጠይቆች በመፈተኛ ቅጹ ለይ«ላ» በሚል ማስተካከያ በተገለጹት የአገታትን መመሪያ ተለይተዋል። ይህ ጠያቂ በምዘና ውጤት መመዝገቢያ ችርት ላይ ደግሞ «R» ተብሎ ተለይቶል።

የአንድ መጠይቅ ነጥብ በተንከባካቢው እገዛ መሰረት ሲመዘገብ በተንከባካቢው የተገለጹትን ባህሪያት አሁኑኑ በአያን ከሚታዩ ባህሪያት ለመለየተ እንዲቻል በቅሉ ለይ የሉትን የቑሚ መስመሮች አሰረጫጨት «R» የሚለውን መክበብ ጠቃሚ ነው።

በዘገባ የቀረቡትን መጠይቆች ስትሰራ (ስትመዘግብ) ለተንከባካቢው «ፍንጭ የሚሰጡ ጥያቄዎችን» አንዳትጠይቅ። ለምሳሌ «ልጅህ በስኒ መጠጣት ይችላል አይደል?» ብለህ ከመጠየቅ ይልቅ «ልጅህ በስኒ መጠጣት ይችላል?» ብለህ ጠይቅ። ተንከባከቢው የምትፈልገውን መልስ አንድመልስልህ ከመገፋፋት አስፈላጊ መረጃዎችን አንድሰጥህ ጥያቄ ስትጠይቀውና ስትመዘግብ ጥንቃቄ አድርግ (በጥልቀት እና/ወይም በምሳሌ አንዲገልጽ አድርግ)። ከዚህም በተጨምሪ «ህጻኑ ይህንን ማድረግ ችላል እንዴ?» ብሎ መጠየቅ ተንከባከቢዋ ሳትሸማቀቅ ዘና ብላ ህጻኑ መመለስ የማይችለውን ሁሉ እንድትዘግብ ይረዳል።

በዚህ ጽሁፍ ውስጥ ተንከባከቢ የሚለው ቃል ለሁለቱም ጾታ የሚያገለግል ሲሆን እናት ወይንም አባት ወይም ሌላ ህጻኑን በዋናነት የምንከባከብና የሚያሳድግ፤ እንድሁም ስለ ልጁ በቂ መረጃ ያለው ሰው ማለት ነው። አንዲሁም ህጻን ማለት ሁለቱንም ጾታ የሚገልጽ ነው።

በፈተና ወቅት የሚከተሉትን እስ□ርብቶ ቀለሞች መጠቀም ተገቢ ነው።

በፈተና «P/ አለፈ» ወይም «NO/ዕድል ያላገኘ» የምለውን ስትመዘግብ አረንገዴ ቀለም ያለውን አስክርቢቶ ተጠቀም።

በፈተና «F/ ወደቀ» «R/ፍቃደኛ አልሆነም» የሚለውን ስትመዘግብ ቀይ አስክርቢቶ ተጠቀም።

P፤ F፤ NO ወይም R የሚባሉት ውጤቶች የሚመዘገቡት በ25-50% ክልል ውስጥ በሚገኘው ነጭ ቦታ ላይ ግልጽ ሆኖ በሚታይበት ሁኔታ መሆን አለበት። Pእና F ሊመሳሰሉ ስለሚችሉ በጥንቃቄ መጻፍ ይኖርባቸዋል።

ጥቃቅን እንቅስቃሴዎች- ሊለመዱ የሚችሉ (fine motor- adaptive)

1. <u>እስከ ግማሽ ክብ መሃል ነዓ ብ ዞሮ ማየት</u>

ህፃኑን በጃርባዉ አንጋለህ አስተኛዉና ከፊትለፊቱ ትኩረት ሊያደርግ በሚችል በግምት 8 ኢንች ከፍታ ላጁ የተጠቀለለ ቀይ ቱባ/ጥቅል ክር በእጅህ እየያዝክ የህጻኑን ትኩረት ለመሳብና ክሩን ፊትለፊት በዓይኑ እየተከተለ ከአንድ አቅጣጫ ወደሌላ በግማሽ ክብ ቅርፅ ሰውነቱን እንድያንቀሳቅስ ክሩን/ቱባውን ደጋግመህ ከአንዱ አቅጣጫ ወደ ሌላ ክብ መስመሩን ተከትለህ አዙር። የክሩን እንቅስቃሴ የህፃኑን ትኩረት ለመሳብ ሲባል በመሃል በመግባት እንድገና መጀመር ይቻላል።

አሳልፈዉ፡- ህፃነ በዓይኑ ብቻ ወይም ጭንቅላቱን ከዓይኑ ጋር እየዞረ ክሩን በዐይኑ የተከተለ በሰዉነቱ ከአንዱ ወደ ሌላ አቅጣጫ እስከ ግማሽ ክብ መሃል ነጥብ ከዞረ።

2. <u>የግማሽ ክብ መሃል ነጥብ አልፎ መዞር</u>

(አፈፃፀሙም «እስከ ግማሽ ክብ መሃል መስመር ዞሮ ማየት» የሚለዉን ዐይነት ትዕዛዝ ነዉ።)

አሳልፈዉ፡- ህፃኑ በዓይኑ ብቻ ወይም ጭንቅላቱን ከዓይኑ ጋር አየዞረ ቀይ ክሩን በዐይኑ እየተከተለ በሰዉነቱ ከአንዱደ ወደ ሌላ አቅጣጫ የግማሽ ክቡን መሀል ነጥብ አልፎ ከዞረ።

የግማሽ ክብን መሃል ነጥብ አልፎ በመዞር ያየ ህፃን (ጥያቄ 2) እስከ መሃል ክብ ነዓ ብ ዞሮ ማየት (ጥያቄ 1) የሚለዉን ያልፋል።

3. <u>ከሽ-ከሽ የሚል የህፃት መጫወቻ መያዝ</u>

ህፃኑ በጀርባው ተንጋሎ ወይንም በወላጅ አቅፍ አያለ የጣቶቹን ጀርባ ጫፍ ድምፅ ባለው (ከሽ ከሽ የሚል) መጫወቻ ንካዉ።

አሳልፈዉ ፡- ህፃኑ መጫወቻውን ለጥቂት ሰኮንዶች ከያዘ አሳልፈዉ።

4. <u>እጆቹን አንድ ላይ ማምጣት</u>

ህፃኑ በጀርባው ተንጋሎ አየለ (በአቅፍ ውስጥ ሳይሆን) እጆቹን ሰዉነቱ መሀከል በደረቱ ላይ ወይም አፉ ላይ እንደሚያመጣ አስተውል። ከላመጣ ጣጥህን በደረቱ ወይም አፉ አከባቢ ሰንዝርለትና ሁለቱ እጆቹን አንድ ላይ ማምጣቱን እየው።

አሳልፈዉ ፡- በዚህ ሁኔታ እጆቹን አንድ ላይ ካመጣ አሳልፈዉ።

5. <u>180 ድግሪችን ዞሮ ማየት</u>

(ይህን ምዘና ለማከናወን «እስከ ግማሽ ክብ መሃል መስመር ዞሮ ማየት» የሚለውን አፈፃፀሙን ሂደት ተከተል።)

ህጻኑ በጭንቅለላቱና አይኑ የክሩን እንቅስቃሴ ተከትሎ ሙሉዉን የግማሽ ክብ መስመር ከአንዱ የሰውነት አከል ወደ ሌላኛው ሙሉ በሙሉ ሮ መከተል ከቻለ፡፡

6. <u>የቡና ፍሬን በትኩረት ማየት</u>

በጠረጴዛ ፊት ለፊት በተንከባከቢዉ ጭን ላይ ህፃኑ ተቀምጦ እያለ በፊትለፊቱ በጠረጴዛ ላጁ የቡና ፍሬ አስቅመጥ፡፡ ለህፃኑ በግልጽ እንድያየውና ትኩረቱንም እንዲስብ ፍፈውን በነጭ ወረቀት ላይ አስቀምጥ፡፡ እጅህንም ወደ ፍሬው እያመለከትክ ወይንም ፍሬውን በእጅህ ወደ ላይ እያነሳ የህፃኑን ትኩረት መሳብ ትችላለህ፡፡ በቡና ፍሬም ምትክ ማንኛዉንም ሞላላ ወይም ክብ ቅርፅ ያለዉን ጥራጥሬ መጠቀም ትችላለህ፡፡

አሳልፈዉ፡- ህፃኑ ወደ ቡናዉ ፍሬ በማያሻማ ሁኔታ ከተመለከተ፡፡

7. <u>አጅ ሰንዝሮ መድረስ</u>

ህፃኑ በተንከባቢዉ ጭን ላይ ተቀምጦ ክርኖቹን ፊት ለፊቱ ባለዉ ጠረጴዛ ላይ አስደግፎ አጆቹን እንዲያሳርፍበት አድርገዉ፡፡ በቀላሉ ሊደርስበት በሚችል ርቀት ላይ በህፃኑ ፊትለፊት ከሽ-ከሽ ወይንም ቀይ ቱባ ክር ወይንም የህጻኑን ትኩረት ሊሰብ የሚችል ነገር አስቀምጥ፡፡

አሳልፈዉ፡- ህፃኑ ያስቀመጥከዉን ነገር ደርሶ ከወሰደ ወይም ለመዉሰድ አጆቹን ወደዚያው አቅጣጫ ከሰነዘረ፡፡

8. <u>ቀይ ጥቅል/ቱባ ክር መፈለግ</u>

ህፃኑ በተንከባከቢዉ ጭን ላጁ ተቀምጦ እያለ ቀይ ቱባ ክር በአይኑ ፊትለፊት ትንሽ ወደላይ አንሳና በማወዛወዝ የህፃኑን ትኩረት ሳብ፡፡ ህፃኑ ወደክሩ በመመልከት ላይ እያለ ክሩን ወደመሬት ልቀቅ፡፡ ክሩን ከመልቀቅ በስተቀር አጅህን ወይንም ክንድህን አታንሳ፡፡የህፃኑ ምላሽ ግልፅ ካልሆን ይህንኑ እንደገና ድገም፡፡

አሳልፈዉ፡-የወደቀዉን ክር ለመፈለግ ወደ ታች ወይም ወደወለሉ ከተመለከተ፡፡

9. <u>የቡናን ፍሬ በመዝገን/በማፈስ መያዝ</u>

ህፃኑ በተንከባከቢዉ ጭን ላይ እንድቀመጥና ክሮቹን ፊትለፊቱ ባለዉ ጠረንጴዛ አስደግፎ እጆቹን በጠረንጴዛው ላይ እንዲቀመጥ በማድርግ እንዲቀመጥ አድርግ፡፡ ከዚያም የቡና ፍፈ ወደ ጠረንጴዛ በመልቀቅ የህጻኑን ትኩረት ሳበዉ፡፡

አሳልፈዉ፡- ህፃኑ ሙሉ አጁን በማንቀሳቀስ እንደመያዝ አይነት አያያዝ አድርጎ የቡናውን ፍፈ ካነሳ፡፡ በድንገት በህጻኑ እጅ ላይ የተጣበቀ ከሆነ ስለማያሳልፈው በትክክል መያዙን አረገግጥ፡፡

ማስጣወሻ፡- ይህንን ምዘና ያልፈ «በአዉራ ጣትና ሌሎች ጣቶች መየዝ» የሚለውን ምዘና ያልፋል፡፡

10. <u>ኪዩብን ከአንድ እጅ ወደ ሌላ ማሳለፍ</u>

ሕፃኑ ከአንድ እጅ ወደ ሌለው እጁ ኪዩብን ማስተላለአ ይችል እንደሆነ አስተዉል፡፡ ይህንንም ለማየት ህፃኑ በተንከባከቢዉ ጭን ላጁ ተቀምጦ እያለ አንድ ኪዩብ አንሳና ስጠዉ፡፡ ኪዩቡን በየዘው እጁ በኩል እንደገና ሌላ ኪዩብ ሰንስርለት፡፡ ብዙውን ጊዜ ህጻኑ ሁለተኛን ኪዩብ ለመቀበል የመጀመሪያውን ወደ ሌላኛዉ እጅ ያነሳል፡፡

አሳልፈዉ፡-ህፃኑ ሰውነቱን፣አፉን፣ወይም ጠረንጴላ ሳይጠቀም ይህንን ካደረገ፡፡

11. <u>ሁለት ኪዩቦችን መውሰድ</u>

ሁለት የእንጨት ኪዩቦችን ጠረንጴላ ላይ ከህፃኑፊት ለፊት አስቀምጓ ፡፡ ህፃኑ ኪዩቦቹን እንዲያነሳ አበረታታው ነገረ ግን አንተ በአጁ ላይ አታርግለት፡፡

አሳልፈዉ፡-ህፃኑ ሁለቱንም ኪዩቦች አንስቶ አንዱን በግራው አንዱን በቀኙ በተመሳሳጁ ጊዜ መያዝ ከቻለ አሳልፈው፡፡

12. <u>በአዉራ ጣትና ሌሎች ጣቶች የዞ ማንሳት</u>

ይህንን ለመመዘን «የቡናን ፍሬ በመዝገን መያዝ» የሚለዉን ጥያቄ አጠያየቅ ሂደት ተመልከት፡፡

ህፃኑ በአዉራ ጣቱና በማንኛዉንም ሌላ አንድ ወይም ከዚያ በላይ ጣቶች በመጠቀም የቡናዉን ፍሬ በመጨበጥ ካነሳ፡፡

ማስታወሻ፡- «በአዉራ ጣትና ሌሎች ጣቶች ይዞ ማንሳትን» ያለፈ ህፃን «የቡናን ፍሬ በመዝገን መያዝ» የሚለውን ያልፋል፡፡ ህጻኑ የቡናውን ፍሬ እንዳውጥ ተጠትቀቅ!

13. <u>በእጅ የተያዙትን ሁለት ኪውቦች ማጋጨት (ዛ)</u>

ለህፃኑ በሁለቱም እጆቹ አንት አንድ ኪዩቦች ስጠውና አንድ ላይ አንድያጋጨው አበረታታው፡፡ በእጆች ኪዩቦቹን በማጋጨት አሳየው፡፡ አንተም ሆነ ተንከባከቢዉ የህፃኑን በእጆች በመየዝ ማገዝ የለባችሁም፡፡ ህጻኑ እንደዝህ ካላደረገ ልላ ግዜ ትንንሽ ነገሮችን ቤት ውስጥ አጋጭቶ የሚያውቅ እንደሆነ ወላጆቹን ጠያቀህ ተረዳ፡፡

አሳልፈዉ፡- በሁለቱ እጆቹ ኪውቦቹን ካጋጨ ወጁንም ወላጆቹን ይህንን እንደሚያደርግ ከዘገቡ አሣልፈው፡፡ ትላልቅ ነገሮችን ለምሳሌ ድስት፤መጥበሻ፤ድስት ክዳን የመሳሰሉትን ብቻ የሚችል ከሆነ አሣልፈው፡፡

14. ኪዩቦችን ኩባያ ዉስጥ ማስገባት

ሦሥት ኪዩቦችንና አንድ ኩባያን በጠረጴዛ ላይ በህፃኑ ፊትለፊት አስቀምጥ። በቃል የነገርከዉና ሰርተህ እያስየኸው ህጻኑ ኪዩቦቹን አንድ በአንድ በኩባያው ውስጥ እንዲጨምር ጠይቀው። አሰራሩን ደጋግመህ ማሳየት ትችላለህ።

አሳልፈዉ፡- ህፃኑ ቢያንስ አንድ ኪዩብ በእጅ ያዞ ኩባያ ዉስጥ ከከተተ በኻላ ኪዩቡ ወደ ታች ኩባያ ዉስጥ እንድወድቅ ከለቀቀ።

15. **መሞነጫጨር**

በጠረጴዛ ላይ ህፃኑ ፊትለፊት ልሙጥ ወረቀትና እርሳስ አስቀምዓ። አስፈላጊ ከሆነ እርሳስ እንዴት እንደሚሰራ የራስህን ስም በመፃፍ አሳየው። እርሳሱን በህፃኑ እጅ ውንጥ በማስቀመጥ አረድዕፍ ማበረታታት ትችላለህ። ነገር ግን እጅን ይዘህ መፃፍ የለብህም። እርሳሱንም አፉ ወይም አይኑ ዉስጥ እንዳይከት ተጠንቀቅ!

አሳልፈዉ፡- ህፃኑ ሆን ብሎ ከሞነጫጨረ። በድንገት በወረቀት ላይ በማጋጨት ወይም በመዉጋት የተፈጠረ ጭረት ግን አያሳልፍም።

16. የቡናን ፍሬ ከብልቃጥ ዉስጥ ደፍቶ ማስወጣት-- በማሳየት

ከብልቃጥ ዉስጥ እንዴት የቡና ፍሬ በመድፋት እንደሚወጣ ሁለት ወይም ሦሥት ጊዜ ደጋግመህ ህፃኑን አሳየዉ። ከዚያ ህፃኑ የቡናዉን ፍሬ እንዲያስውጣ ጠይቀው። «አውጣ» የሚለዉን እንጂ «ድፋው» የሚለውን ቃል አትጠቀም።

አሳልፈዉ፡-ህፃኑ የቡናዉን ፍሬ ጣርሙሱን በመድፋት ከስወጣ ወይም ወደ ጠርሙሱ አፍ እያንከባለለ በእጅ ዘግኖ ካስውጣ።

17. በኪዩቦች ግንብ (ክምር) መስራት፤ 2፣ 4፣ 6፣ 8

ህፃኑን ጠረጴዛን መጠቀም በሚያስችለዉ ከፍ ብሎ እንዲቀመጥ በማድረግ ክርኖቹ ደግሞ በጠረንዛው ወለል ጠርዝ እንዲሆኑ አትርሳ። ጠረጴዛው ላይ ከህፃኑ ፊት ለፊት ኪዩቦቹን አስቀምጥ። ከዚያም ህፃኑ አንዱን ኪዩብ በሌላው ኪዩብ ላይ ደርቦ እንዲያስቀምጥ በቃላት አብራራለት ወይም እየሰራህ አሳየው። ኪዩቦቹን አንድ በአንድ (ተራ በተራ) በእጁ በማስያዝ (ማቀበል) ጠቃሚ ይሆናል። ለአንድ መጠይቅ ሶስት የሙከራ ዕድሎች ሊሰጠው ጁችላል።

አሳልፈዉ፡- ህፃኑ ሁለት ኪዩቦችን ወስዶ አንዱን ኪዩብ በሌላኛዉ ላጁ ደርቦ ካስቀመጠ እና እጆቹን ከኪዩቦች ላጁ ሲያነሳ የተደረደረው ኪዩብ ካልወደቀ።

እንደዚሁም 4፣6 ወይም 8 ኪዩቦችን እንደመጠናቸው በተመሳሳጁ ሁኔታ ከታች ወደላይ በቅደም ተከተል በሶስት ሙከራች ደራርቦ ማስቀመጥ ከቻለ አሳልፈዉ። አንድ ህፃን 4፣ 6፣ ወጁም 8

ኪዩቦችን ደራርቦ በማስቀመጥ ካለፈ ከእያንዳንዱ የኪዩብ መቆለል ያለውን ሌላ የኪዩቦች መደራረብ መጠይቅንም ያልፋል፡፡ (ለምሳሌ የ6 ኪዩቦችን መደራረብ መጠይቅ ያለፈ ልጅ የ2 እና የ4 ኪዩቦች መደራረብ መጠይቆችን ያልፋል፡፡)

18. <u>ቀጥ ያለን መስመርን አስመስሎ ማንሳት</u>

ህፃኑን በጠረጴዛ ላይ ለመፃፍ በሚመች ሁኔታ አስቀምጠውና ልሙጥ ወረቀት በጠረንዛው ላጭ አድርገህ እርሳሰ በመጠቀም ቀዓታ መስመር በማንሳት ለህፃኑ አሳየው፡፡ አንተ የሰራኸውን አይነት እንዲሰራ ንገረው ፡፡ መስመሩን ስትሰራ ወደህፃኑ አቅጣጫ እየጫርክ አሳየው፡፡ ሦሥት ሙከራችን ስጠዉ ፡፡ እጁን በመየዝ ግን አታሳየው፡፡

አሳልፈዉ፡- ህፃኑ አንድ ወይም ከዚያ በላይ ሁለት ኢንች ርዝመት ያላቸዉና አንተ ከሰራኸዉ መስመር 30 ዲግሪ በላጭ ልዩነት የሌላቸውን መስመሮች በወረቀቱ ላይ ከሰራ፡፡ መስመሮቹ የግድ ሙሉ በሙሉ ቀጥ ያሉ መሆን የለባቸዉም ፡፡

19. <u>አዉራ ጣትን ማነቃነቅ</u>

የአንድ ወይም ሁለቱ እጆጅህን አውራ ጣቶች ወደላይ እንዲመለከት አድርገህ ሌሎቹን በመጨበጥ ለህፃኑ አሳየዉ፡፡ አዉራ ጣትህን ወደ ታችና ወደ ላይ በማነቃነቅ ህፃኑም እንዳንተ አዉራጣቱን/ቶቹን ብቻ አንዲያንቀሳቅን ንገረው፡፡ ህጻኑ እጅን ቡጢ እንዲያደርግ መንገር ትችላለህ፡፡ ግን እየያዝክ አታስተከክልለት፡፡

አሳልፈዉ፡- ህፃኑ ሌሎች ጣቶቹን ሳያንቀሳቅሰ (አንደጨበጠ) አውራ ጣቱን/ጣቶቹን ብቻ ዘንበል-ቀና በማድረግ ካንቀሳቀሰ፡፡

20. <u>oን መፃልበዓ</u>

ፊትለፊቱ ባለዉ ጠረጴዛ ላይ ለህፃኑ ልሙጥ ወረቀትና እርሳስ አስቀምጥለትና ከዉጤት መመዝገቢያ ቻርት በስተጃርባ ያለዉን ሞላላ ቅርፅ አሳየዉ፡፡ አስፈላጊ ከሆነ እርሳስ እንዴት እንደሚሰራ የራስህን ስም በመፃፍ አሳየው፡፡ የቅርጹን ስም ያሳየኸውን አይነት ቅርን እንዲሰራ ለህፃኑ ንገረዉ፡፡ ሦሥት ሙከራ ልትሰጠዉ ትችላለህ፡፡

አሳልፈዉ፡- ህፃኑ ክብ መሣይ ነገር ወይም ወደክብነት የሚጠጋ ማንኛዉንም ቅርፅ ከሰራ፡፡ ተከታታይ የሆነ የዝግዛግ መስመር ያለዉ ክብ ከሆነ ግን አያልፍም ፡፡

21. <u>የሰዉ ምስል ማንሳት--3 ክፍሎች፤6 ክፍሎች</u>

ለህፃኑ ወረቀትና እርሳስ ስጠው፡፡ አስፈላጊ ከሆነ እርሳስ እንዴት እንደሚሰራ የራስህን ስም በመፃፍ አሳየዉ፡፡ ከዚያም የሰዉ ስዕል (ለምሳሌ፤ የወንድ ልጅ፤የልጃገረድ፤ የአባት፤ የእናት

ወዘተ) እንዲያነሳ ንገፈው፡ ዉጤት ከመመዝገብህ በፊት ህፃኑ ስክሉን ሥሎ መጨረሱን አረጋግጥ፡፡

ሦሥት ከፍሎች አሳልፈዉ፡- ህፃኑ 3 ወይም ከዚያ በላይ የሰዉነት አከላት ያለዉን ከሳለ ፡፡ ጥንድ የሰዉነት ክፍሎች (ጆሮች፤አይኖች፤አጆች፤ክንዶች፤አግሮች) እንደ አንድ ይቆጠራሉ፡፡ ነጥብ ለማፅኘት ሁሉም የጥንድ ክፍሎች መሳል አለባቸዉ፡፡ ከልሆነ ግን ሥዕሉ የአንድ ጎን ብቻ ይሆናል (ለአንድ አይን፤ጆሮ ወዘተ ዋጋ አይሰጥም)፡፡ በፈተና ወቅት ማንኛውም ያልተለመደ ስዕል ህፃኑ ተቀባይነት ያላቸዉን ክፍሎች መለየት መቻሉን ካስተዋልክ ማስታወሻ ያዝ፡፡

ስድስት ክፍሎች አሳልፈዉ ፡- ህፃኑ ስድስት ወይም በላይ የሰዉነት ክፍሎችን ከሳለ ፡፡ (ሦሥት ክፍሎች በሚለዉ ስር ያሉትን መስፈርቶች ተመልከት)፡፡ ሥድስት የሰዉነት ክፍሎችን በመሳል ያለፈ ሦስት የሰዉነት ክፍሎችን መሳል የሚለዉን ያልፋል ፡፡

22. <u>+ን መገልበጥ</u>

ፊትለፊቱ ባለዉ ጠረጴዛ ላይ ለህፃኑ ልሙጥ ወረቀትና እርሳስ አስቀምጥለትና ከዉጤት መመዝገቢያ ቻርት በስተጃርባ ያለዉን መስቀል ቅርፅ አሳየዉ፡፡ አስፈላጊ ከሆነ እርሳስ እንዴት እንደሚሰራ የራስህን ስም በመፃፍ እሳየው፡፡ የቅርፁን ስም ሳትጠራ ያሳየኸውን አይነት ቅርፅ እንዲሰራ ለህፃኑ ንገረዉ ፡፡ሦሥት ሙከራ ልትሰጠዉ ትችላለህ ፡፡

አሳልፈዉ፡- ህፃኑ ቢያንስ ሁለት መስመሮች ወደመሃል አከባቢ እንዲቆረጡ አድርጎ ከሰራ ፡፡ መስመሮቹ የግድ ቀጥ ያሉ መሆን የለባቸዉም፡፡ ነገር ግን ሁለቱም መስመሮች በሁለት ጊዜ ጭረት ብቻ(እጅ ከወረቀት ሳይነሳ) የተሰሩ መሆን አለባቸው፡፡

23. <u>ረዥሙን መስመር መለየት</u>

በፈተናዉ ዉጤት መመዝገቢያ ቻርት በስተጃርባ ያሉትን ሁለት ትይዩ መስመሮችን ለህፃኑ አሳይና «ረዴሙ መስመር የትናው ነዉ?» ብለህ ጠይቀዉ፡፡ «ትልቁ መስመር» እንዳትል ተጠንቀቅ፡፡ ህፃኑ መስመሩን ከጠቆመህ በኋላ ወረቀቱን ከላይ ወደታች በመገልበጥ ይህንኑ ጥያቄ ድገምለት፡፡ እንደገና ወደጎን በማዞር ለሦሥተኛ ጊዜ ያንኑ ጥያቄ ድገምለት፡፡ ህፃኑ ሦሥቱንም ጊዜ በትክክል ከልመለሰ ሦስት ተጨማሪ ዕድሎችን ስጠው፡፡

አሳልፈዉ፡-ህፃኑ ከ3ቱ ጊዜያት 3ቱ በትክክል ከመለሰ ወይንም ከ6ቱ ጊዚያት 5ቱን በትክክል ከመለሰ፡፡

24. □ን መገልበጥ-- ሳያሳዩት

ማሳሰቢያ፡-□ን በማሳየት አንዲገለብጥ ከማዘዝህ በፊት □ን ሳታሳይ ኖታን እንዲገለብጥ አድርግ!!!

ፊት ለፊቱ ባለዉ ጠረጴዛ ላይ ለህፃኑ ልሙጥ ወረቀትና እርሳስ አስቀምጥለትና ከዉጤት መመዝገቢያ ቻርት በስተጃርባ ያለዉን ባለካሬ ቅርን ሥክል አሳየው፡፡ አስፈላጊ ከሆነ እርሳስ እንዴት እንደሚሰራ የራስህን ስም በመፃፍ እሳየው፡፡ የቅርፁን ስም ሳትጠራና እራስህ ሥክሉን አንስተህ ሳታሳየው የተመለከትከውን አይነት ቅርን እንዲያነሳ ለህፃኑ ንገረው፡ ሦሥት ጊዜ ሙከራ ልትሰጠዉ ትችላለህ፡፡

አሳልፈዉ፡- ህፃኑ ቀጥታ መስመሮችን በመጠቀም ባለ4 ጎን እኩል ማዕዘን ያለው ሳጥን ከሳለ፡፡ ማዕዘኖች በሚተላለፉ መስመሮች የተገጠሙ ሊሆኑ ቢችሉም አንግሎቹ ግን የግድ ወደ 90 ድግሪ የተጠጉ/የቀረቡመሆን አለባቸዉ፡፡ ክብ መሳይ ወይም ሹል አይነት መሆን የለባቸዉም፡፡ የቁመቱ ርዝመትም ከስፋቱ 2 እጥፍ ያነሰ መሆን አለበት፡፡

ሳያሳዩ □ን መገልበጥ የቻለ ህፃን □ን አይቶ መገልበጥ የሚለውን ያልፋል፡፡

25. □ን መገልበጥ--ያሳዩት

ህፃኑ በቻርቱ ላይ ያለዉን አራት እኩል ጎን ሳዓን ሳያሳዩት መገልበጥ ከልቻለ ሁለት ተቃራኒ/ ትይዩ መስመሮችን በመስራት ቀጥሎም ሌሎች ሁለት ትይዩ ሆነው የመጀመሪያዎቹን ትይዩ መስመሮች የሚያቋርጡ መስመሮችን ባልተቆራረጠ ሁኔታ (እጅህን ከወረቀት ላይ ሳታነሳ) በመስራት ሳጥን መሰል ቅርፁን እንዴት እንደምሰራ አሳይ፡፡ ሦስት ጊዜ በመገጋገም እያሳየህ ሦስት ጊዜ አንዲሞክር ዕድል ስጠው፡፡

አሳልፈዉ፡- □ን ሳያሳዩ እንዲገለብጥ በተጠቀምከዉ መስፈርቶች አሳልፈው፡፡

Annex 7: Anthropometry measurement

Length measurement

Data collectors

	Lomi		Elfnesh		Meseret		worknesh	
Study subjects	1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	77	77.2	77.1	77.1	77.2	77	77	77
2	84.8	84.7	84.7	84.6	84.8	84.8	84.8	84.7
3	78	78	78.1	78.2	78	77.9	78	78
4	82	82.1	82	82.1	82	82	82.1	82.3
5	84.1	84	84	84.2	84	84	84	84.2
6	79	80	79	79	79.1	80	79	80
7	76.4	76.3	76.3	76	76.4	76.5	76.4	76.4
8	83	83.1	83.1	83	83.2	83.3	83.1	83.2
9	78	78.1	78	78.3	78.1	78.2	78	78
10	76	76.1	76	75.9	76.1	76.1	76	76.2

Weight measurement

Data collectors

	Lomi		Elfinesh		Meseret		Worknesh	
Study subjects	1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	10	10.2	10.2	10.3	10.4	10.5	10	9.8
2	8	8.2	8.5	8.3	8	8.3	8.5	8.4
3	11.5	11.6	11.3	11.2	11	11.3	11.4	11.6
4	7.8	7.9	7.7	7.5	7.6	7.8	7.5	7.8
5	11.6	11.9	11.5	11.5	11.6	11.4	11.2	11.3
6	12.5	12.2	12.3	12.3	12.4	12.5	12.5	12.6
7	12	11.8	11.9	12	12	12	12.1	11.8
8	9.7	9.6	9.5	9.7	9.6	9.8	9.5	9.6
9	13	13.2	12.8	13	13.1	12.8	13.2	13
10	11	11.2	11.1	11.4	11.3	11.5	10.9	11.2

TEM for each data collector

The Intraobserver TEM was calculated based on the measurements were done. All the data collectors were within the acceptable range. (acceptable range is weight 0.1- 0.3 and for length is 0.001-0.008)

Length

Lomi=0.023

Elfnesh=0.01

Meseret =0.021

Worknes=.0.023

Weight

Lomi=0.14

Elfinesh=0.11

Meseret=0.15

Worknesh=0.14

The inter TEM was in the acceptable range

Length =0.05 and Weight=0.17

Curriculum vitae

Personal data

Name: Radiate Shiferaw

Sex: Female

Date and place of birth: 1992 G.C

Addis Ababa Ethiopia

Address: Tel no 0932150898

Email redshf@gmail.com

Addis Ababa Ethiopia

Nationality: Ethiopian

Languages spoken

language	Speak	Read	Write
Amharic	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent

Educational background

School/university	Complited award	Year
Assai public school	12ht grade	1998-2010 G.C
Mizan tepi university	BSC in public health	2011-20014 G.C

Work experience

	POSITION	Employer	Area	Length
1	Health officer	Minister of health	Belela health center, Seraro wereda,West Arsi zone	20014 to 2015 G.c
2	Health officer	Minister of health	Aredano ahifa health center Shasemene wereda. West Arsi zone	2015 to 2016 G.C
3	Assistant lecturer	Mizan Tepi university	Mizan town, Bench Maji Zone. SNNPR.	2017 to 2018 G.C

Trainings

- ✓ IMNCI (integrated management of infant and child illnesses)
- ✓ ENA (essential nutritional action)
- ✓ Management of severe acute malnutrition

Other skills

- ✓ Computer skills
- ✓ Excellent time management skills
- ✓ Ability to work in group and independently

I hear by would like to confirm that the above mentioned data are true.

Name Radiate Shiferaw

Signature

Date

Curriculum Vitae

Name: Robel Yirgu

Sex: Male

Age: 33

Home Address

Addis Ababa

Cell: 0924407180

Office no: 0115547319

EDUCATION	
February, 2013	**Master of Public Health** (MPH, in Epidemiology), Department of Preventive medicine, School of Public Health, Addis Ababa University.
June, 2006	**Bachelor of Science (Bsc),** Department of Public Health, College of Health Sciences, Haramaya University.
SHORT COURSES	
April-June, 2017	**Clinical Research and Evidence-based Medicine (SCREM),** Institute of Tropical Medicine (ITM), Antwerp, Belgium.
June, 2013	**Reproductive Health Commodity Security**, Department of Reproductive Health, School of Public Health, Addis Ababa University.
January 20-23	**Scientific Grant Writing,** Medical Education Partnership Initiative (MEPI), College of Health Sciences, Addis Ababa University.
WORK EXPERIENCE	
2013- 2018	**Lecturer,** School of Public Health, Addis Ababa University.
Since Nov, 2017	**Graduate Program Coordinator**, School of Public Health.
2009-2010	**Assistant lecturer,** College of Health Sciences, Adama University.
2009-2010	Head, Department of Public Health, College of Health Sciences,Adama University.
2007-2009	**Graduate assistant I & II,** College of Health Sciences, Adama University.
RESEARCH EXPERIENCE	
Since, 2017	**Co-investigator:** Technology Enabled Maternal and child health care (TEMACC) intervention research project.A.A.U,University of Linz, Austria

Email: yirgurob@gmail.com

Since, 2013	**Regional coordinator**: "Performance Monitoring and Accountability 2020" a survey designed to develop a mobile-Assisted Data and Dissemination System (mADDS) using mobile devices to measure core and country specific indicators of family planning service need and utilization in ten countries of Africa and Asia. A national community and facility based survey, A.A.U, Ministry of Health and Johns Hopkins University.
Since, 2014	**Research coordinator: "**Facility Assessment For Reproductive Health Commodities and Services". An annual national facility based survey. A.A.U, UNFPA.
Since, 2017	**Research coordinator:** Performance Monitoring and Accountability 2020: Women and Girls' Empowerment and sexual and reproductive choices. ***A qualitative study*** A.A.U, Ministry of Health and Johns Hopkins University.
2015	**Research Assistant: "**Enhancing Demand and Quality of Community Based Family Planning Including Long Acting Contraceptive Services Provided at Health Posts and Health Centers in Amhara Region Project ***Pre-Implementation Qualitative Assessment***" JSI, L10K.
2014-2016	**Research Coordinator:** *"*The role of Phone-based applications and client centered communication in improving maternity and family planning services". Addis Ababa University and UNFPA.
2015	**Principal investigator:** Can socio cultural factors determine diagnostic delay for TB treatment in rural Ethiopia, ***a qualitative study***
2014	**Research assistant:** "Respectful maternity care, ***a qualitative study*** in Amhara and Sothern Nations Nationalities and peoples' regions of Ethiopia" JSI, L10K.
2014	**Principal investigator:** Determinants of delayed care seeking for TB suggestive symptoms in rural Ethiopia: a community based unmatched case-control study
2013	**Research assistant:** "Effect of maternal death on living children in central part of Ethiopia, ***a qualitative study***". A.A.U and University of Harvard.
2013	**Research Coordinator:** "Values at bed side" a national survey of ethical dilemmas physicians face in Ethiopia. A.A.U, University of Bergen, Norway

PUBLICATIONS	- Sisay MM, **Yirgu R,** Gobezayehu AG, Sibley LM. (2014). Unheard souls in the backyard: ***a qualitative study*** of attitudes and values surrounding stillbirth and neonatal mortality among grandmothers, mothers and unmarried girls in rural Amhara and Oromia regions, Ethiopia. *Journal of Midwifery and womens' health*, 59(1), 110-7. https://www.ncbi.nlm.nih.gov/pubmed/24588912 - **Yirgu R,** Molla M, Gobezayehu A, Sibley A. (2016). Perinatal mortality magnitude, determinants and causes in West Gojam: population-based nested case-control Study. *Ploseone*,11 (7). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4965173/ - **Yirgu R,** Sibley L, Molla A.(2017) Determinants of neonatal mortality in rural Northern Ethiopia: A Population based nested case control study. *Ploseone*. http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0172875 - **Yirgu R**, Lemessa F, Hirpa S, Alemayehu A, Klinkenberg E.(2017) Determinants of delayed care seeking for TB suggestive symptoms in rural Ethiopia: a community based unmatched case-control study. *BMC Infectious diseases*. https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-017-2407-8 - Fenta E, **Yirgu R**, Shikur B, Hagos S. (2017) Single 24-hour recall overestimates exclusive breast feeding practices among infants aged less than six months in rural Ethiopia. *BMC Nutrition* https://internationalbreastfeedingjournal.biomedcentral.com/articles/10.1186/s13006-017-0126-9 - Moges G, Getachew B, Shiferaw S, **Yirgu R**.(2016) Under nutrition and its determinants among daily laborers working in cobblestone project in Ethiopia. *Global Journal of Public Health and Medicine* http://www.gjmedph.com/uploads/O3-Vo5No2.pdf - Zelalem A, Endeshaw M, Awoke M, Shiferaw S, Yirgu R. Effect of Nutrition Education on pregnancy specific nutrition knowledge and healthy dietary practice among pregnant women in Addis Ababa. *Clinics in Mother and child Health*

	- Moges T, Shiferaw S, **Yirgu R**, Gebremichael B. Is small play area in private schools and adolescent's sedentary behavior linked to overweight and obesity in Addis Ababa, Ethiopia? A comparative cross-sectional Study. *Journal of Epidemiology and health* file:///C:/Users/Robel/Desktop/Working%20files/Academic%20promotion/Is%20inadequate%20play%20area%20.pdf - Dereje D, **Yirgu R**, Chichyibelu T. Magnitude of Overweight/Obesity and Associated Factors among High School Adolescents' in Addis Ababa, Ethiopia. *Journal of Nutritional disorders and therapy* file:///C:/Users/Robel/Desktop/Working%20files/Academic%20promotion/magnitude-of-overweightobesity-and-associated-factors-among-high-school-adolescents-in-addis-ababa-ethiopia-2161-0509-1000231.pdf - Workneh A, Shiferaw S, Spigit M, **Yirgu R**, Geertjan D. Designing mHealth for maternity services in primary health facilities in a low-income setting – lessons from a partially successful implementation. *BMC Medical informatics and Decision making* file:///C:/Users/Robel/Desktop/Working%20files/Academic%20promotion/Designing%20mhealth%20for%20maternity%20services.pdf
GRANTS RECEIVED 2015 2016 2017	**PI:** Operational research grant for a research on TB, KNCV/USAID/TB CARE-I (9,500.00 USD) **PI:** Adaptive problem solving research grant, Addis Ababa University (5,000.00 USD) **Co-PI:** Thematic research grant, Addis Ababa University (60,000.00 USD)
REFERENCES	- Dr. Mitike Molla (PhD, MPH, Bsc) Dean, School of Public Health, Addis Ababa - Tel-0911131805 - E-mail- mitikemolla@gmail.com - Dr. Assefa Seme(MD, MPH), Head, Department of Reproductive Health and Health Service Management, School of Public Health, Addis Ababa

	University - Tel- 0911228193 - E-mail- assefaseme@gmail.com - Dr. Solomon Shiferaw (MD, MPH) Public Health Nutrition unit, Department of Reproductive Health and Health Service Management, School of Public Health. - Tel- 0911406845 - E-mail- solomonshiferaw@gmail.com

ASSURANCE OF PRINCIPAL INVESTIGATOR

I, the undersigned MPH student declare that this thesis is my original work in fulfilment of requirement for masters of public health in nutrition.

Name of the student: Rediate Shiferaw

Signature_____ Date _____

Approval of the primary advisor

Name of the primary advisor: Mr. Robel Yirgu

Signature_____ Date _____