# ADDIS ABABA UNIVERSITY

# COLLEGE OF HEALTH SCIENCE

# SCHOOL OF NURSING AND MIDWIFERY

## PRACTICE OF EARLY CHILDHOOD GROWTH AND DEVELOPMENTAL MILESTONE ASSESSMENT AND ITS DETERMINANTS AMONG HEALTH PROFESSIONALS WORKING AT PUBLIC HOSPITALS IN ADDIS ABABA, ETHIOPIA

**INVESTIGATOR: HAILESLASSIE TESFAY TADESE**

**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVDERSITY, COLLEGE OF HEALTH SCIENCE, SCHOOL OF NURSING AND MIDWIFERY FOR PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN PEDIATRIC AND CHILD HEALTH NURSING**

**JUNE 2018**

**ADDIS ABABA, ETHIOPIA**

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# APPROVAL SHEET

ADDIS ABABA UNIVERSITY

COLLEGE HEALTH SCIENCE SCHOOL OF NURSING AND MIDWIFERY

I, the undersigned MSc student, declare that I have submitted my original work on a title practice of early childhood growth and developmental milestone assessment and its determinants among health professionals working at public hospitals in Addis Ababa, Ethiopia, 2018.

**Submitted by:**

**Haileslassie Tesfay Tadese** _____ / / 2018

Name of investigator Signature Date

This thesis work has been submitted to the school of graduate studies of Addis Ababa university, college of health science, school of nursing and midwifery with my approval as an advisor.

**Approved by**:

1. Tewodros Tesfaye(BSc, MSc) _____ / /2018
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2. Girum Sebsibe (BSc, MSc, PHD fellow) _____ / /2018
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## APPROVAL BY THE BOARD OF EXAMINATION

This thesis by Haileslassie Tesfay Tadese is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of masters in pediatrics and child health nursing

**EXAMINER:**

**Semarya Berhe Lemlem** (Asst. Professor, PhD Fellow) _____ _____ _____

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_____ _____ _____ _____

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# DECLARATION

I the undersigned declare that, this thesis is my original work, has not been presented for a degree in this or any other University and all sources of materials used for this thesis have been recognized through citation. Every effort has been made to avoid plagiarism in the preparation of this thesis.

Name: Haileslassie Tesfay Tadese

Signature: _____

Date: _____

Place: Addis Ababa University, Ethiopia

Date of submission _____

This thesis work has been submitted for examination with my approval as University advisor

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Date: _____

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# ACRONYMS AND ABBREVIATIONS

AAP- American Academy of Pediatrics

ADHD- Attention Deficient Hyperactivity Disorder

BMIFA- Body Mass Index for Age

CCGMP- Community Counsel for Growth Monitoring and Promotion

CSC- Community service counsel

DD-Developmental Delay

FTT- Failure to Thrive

GMP- Growth Monitoring and Promotion

HC- Head Circumferences

IDEA- Individual with Disabilities Education Act

IMCI- Integrated Management of Child Illness

LHFA- Length/Height for Age

LMICs- Low and Middle Income Countries

MUAC- Mid Upper Arm Circumferences

SD- Standard Deviation

UNICEF- United Nation children fund

USA- United States of America

WFA- Weight for Age

WFLH- Weight for Length/Height

WHO – World Health Organization

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# ABSTRACT

**Background:** In developing nations, 200 million children (~39%) under age five have developmental delay. In USA, 13-16% children under five have developmental difficulties. This huge gap between developed and developing countries is due to lack of early detection and intervention in low and middle-income countries. Universal use of standardized assessment tools was only (2.6%). The practice of growth and developmental assessment is also poor even in the western countries 1.1% practice of filling developmental assessment tools and 75% inconsistent use of growth monitoring charts.

**Objective:** To assess practice in early childhood growth and developmental assessment and its determinants among health professionals working in public hospitals in Addis Ababa, Ethiopia, 2018

**Method:** Facility based descriptive cross-sectional study design was conducted with a total sample size of 268 health professionals from six public hospitals in Addis Ababa, Ethiopia The data were collected using pretested structured questionnaire adapted from literatures and evaluated by eight experts for content validity. Data had entered in to Epi Data Software version 4.2 and then exported and analyzed by SPSS version 23, software for bivariate and multivariable logistic regression (LR) analysis. Significant association was seen at $p<0.05$ & the strength of association were expressed using odds ratio.

**Results:** Practice of early child hood growth and developmental milestone assessment were less than average (38.2% and 27.8%) respectively. Female sex [(AOR = 2.025(1.012-4.037) at P= 0.046, general practitioners (AOR = 7.416 (2.455-22.401) at P = 0.000, work experience greater than eleven years (AOR =7.281(1-53.171) at P=0.005, additional training [AOR =3.97(1.585-6.445) at P = 0.001] were significantly associated with early childhood good growth assessment practice with 95% CI. General practitioners [(AOR = 23.826 (6.77- 83.9) at P = 0.000, health officer (AOR = 11.02, 95%CI: 2.1-58.812) at P = 0.005, and work experience greater than eleven years (AOR=20.897(1.5-291.49)] at P =0.024] were significantly associated with good practice.

**Conclusion and recommendation:** Assessment of early childhood growth and development practice remains poor. Training and experience sharing among different professions & assigning professionals with highest work experience at the service could improve the practice level.

**Keywords:** early child hood, Growth and developmental milestone assessment, Practice

# 1. INTRODUCTION

## 1.1 Background

Growth and developmental assessment is a continual process of observing, gathering, recording, and interpreting information to answer questions and make developmental and instructional decisions on children. It measures young children's performance over time. [1] when the early age assessment practiced, growth and developmental problems have detected early before significant morbidities occur. Significant changes in the physical and neuro-psychomotor development takes place in early first two years of life [19] children younger than 3 years of age (36 months) who are at risk of having developmental delays might be eligible for early intervention treatment services.[20] According to the WHO classification early childhood refers birth to five years. [22]

The assessment of growth and development helps to determine the nutritional and health need of a child. It identifies growth failure and developmental delay in children. Early assessment of child growth and development helps to detect and treat abnormal growth and developmental problems before it cause significant developmental morbidity. The strategies to assess growth and development in children include measurement of weight, height, head circumference, mid upper arm circumference (MUAC) and age appropriate milestone assessment. All this measurements should be supported using accurate, reliable equipment and correct measuring techniques. Majority of causes for growth failure and developmental delay should be addressed using cost effective growth and development monitoring and intervention strategies [2] [3]

Some of the strategies are universal child and family health services, the use of standardized and evidence-based assessment tools, surveillance that all allows for the early identification of children with developmental delay, and provision of early intervention services. [4] Literatures show that early intervention can significantly improve developmental outcomes. [5]

In order to monitor growth and development with the above stated parameters the world health organization and UNICEF had published a proven affordable and relatively

straightforward guideline. According to the guideline if a child skips two percentiles of his or he trajectory he or she will be considered as having growth failure from either of the above domains. However, when assessing development, if a child does not fulfill what is expected from his age especially for the required developmental aspect he or she will be considered to have developmental delay.

Failure to thrive (FTT) is inadequate growth or the inability to maintain growth, usually in early childhood. A careful history and physical examination can identify most causes of FTT. It is diagnosed by simple anthropometric measurements. These include body mass index, length for age, weight deceleration crossing two major percentile lines, weight for age less than the 5th percentile. Weight less than 75 percent of median weight for age, weight less than 75 percent of median weight for length, and weight velocity less than the 5th percentile is also additional measurements. [6]

When a child is not developing and/or achieving skills according to the expected time frame he or she should be suspected us developmental delay.[7] Currently different countries use child development surveillance to monitor developmental status. It is a process where skilled health care providers assess the children's development to guide and intervene developmental delay in collaboration with families. [8] Despite the technical advances in assessing these two major parameters, little is known about the practice of growth and development assessment. To establish the diagnosis of growth failure and developmental delay, it is important that these parameters be assessed regularly at primary health care centers. According to the standard, the recommended approach to monitor growth and development is therefore, closely monitoring each child growth and development pattern separately for male and female. There is no documented Literature on growth and developmental assessment practice on this area.

## 1.2 Statement of the problem

Worldwide an estimated 161 million children in 2013 are falling below -2 SD from the length for age or height for age according to WHO child growth standards. [9] In developing nations, 200 million children (~39%) under age five are not reaching their developmental potential because of easily preventable factors. [10] A research review by WHO 2012 on Prevention, early identification, assessment and intervention in low- and middle-income countries shows that low and middle-income (LMIC) countries face new challenges in promoting child development. [11] Studies from the USA Centers for Disease Control, show that the prevalence of developmental disabilities in the USA from 1997 to 2008 was 13.7%.[12] This huge gap in child developmental problems between developed and developing countries is because of lack of a system for the promotion and monitoring, prevention, early identification and early interventions strategies in this child care service.

Lack of appropriate knowledge and expertise in health professionals to provide adequate service in child growth and development is also another factor according to the review. [11] A literature on risk factors for growth and developmental delay among preschool children in developing countries by advanced biomedical research 2013 shows that, significant association between growth retardation in early childhood and functional impairment in adult life. Poor growth is also associated with delayed mental development which leading to poor school performance and reduced intellectual achievement. [13] Most children with FTT (80%), present before 18 months of age. A detailed initial growth and developmental assessment leads to the diagnosis of 20% of the cases of DD. In the United States, many children with growth developmental disabilities are identified after age 10 when significant delays already might have occurred and opportunities for treatment might have been missed. [12] This shows early child growth and developmental assessment and intervention is still low even in the developed countries.

A community based cross-sectional study done in Ethiopia shows that from all infants and young children involved in the study 28.13% exhibited global developmental delay, i.e., delay in two or more areas of development. The result of the finding shows more delayed developments seen in fine motor, personal, social and problem solving developmental

domains. This might show children have not allowed practicing skills to promote development in these specific areas. [14] with the exception of this community based study developmental delay reports and practice of early identification of developmental delay has not documented in Ethiopia.

Early identification of the young child in high-income countries who has developmental delays or deficits is recognized as an essential part of good healthcare for children in regular pediatric practice.[15] It is an integral function of the primary care medical home and an appropriate responsibility of all pediatric health care professionals. Growth monitoring and developmental surveillance should have incorporated at every well-child preventive care visit. Any concerns rose during monitoring and surveillance should have to be promptly addressed with standardized growth charts and developmental screening tests. It is also recommended that regular screening at the 9-, 18-, and 30-month well child visits.[16] this service has not well known in developing countries including Ethiopia.

Despite many recommendations and proven effectiveness of early child hood growth and developmental assessment, the practices were remained low even in developed countries. In Brazil, the percentage of filling out of the child development surveillance was 1.1%. [17] Consistent, universal use of these tools was only (2.6%). [18]

To conclude, to promote early identification, intervention and referral of a child with developmental delay health care providers should practice child growth and developmental assessment early in life based on the standard. Despite many recommendations and proven effectiveness of early child hood growth and developmental assessment, the practice is low in even in developed countries. The practice of child growth and developmental assessment is undocumented in Ethiopia except some community based growth monitoring and promotion practice in family studies. Even, the findings of the studies in the communities show low practice of growth monitoring and promotion practices. Generally, the burden in growth and developmental delay and lack of information on the practice of early child hood growth and developmental assessment initiates the need of this study.

## 1.3. Significance of the study

The initial point that intends me to conduct my study in this title is a case scenario that I have faced in one private hospital related on assessing a child with language developmental delay. The professional frustrated in assessing and classifying the three-year-old child with language developmental delay. He also referred to inappropriate facility.

Different studies give emphasis on the importance of child growth and developmental assessment for early identification, treatment and referral of growth and developmental problems. Worldwide the practice of early identification of child growth and developmental problems is low as seen in the literatures. Health professionals' practice of early identification of growth and developmental problems has not documented in Ethiopia. Again, there are no strategies documented to assess child development effectively as child growth assessment and the practice of growth monitoring in the study area. Therefore, this study will help to identify the gaps in this basic childcare practice.

Early child hood growth and developmental assessment is a strategy to asses and intervene growth and developmental related child hood problems before it causes significant morbidity. Assessment of this basic childcare is a responsibility of all health professionals that provide a care for children. This study mainly focuses to identify the gap by assessing the current practice and determinants in assessing early child hood growth and development among health professionals. Therefore, this study contributes:

1. To identify practice gaps in child growth and developmental assessment and to provide interventions aimed at increasing professional's emphasis to practice growth and developmental assessment at early age of the child.
2. As an input to policy makers on developing effective child care strategies specific to this area
3. As base line data for researchers to deal on practice and determinants of early child hood growth and developmental assessment
4. To design an interventional project on child hood growth and development related service in the community

# 2 LITERATURE REVIEW

## 2.1 Review on Burden and Practice of Child Growth and Developmental Assessment

Significant changes in the physical and neuro-psychomotor development takes place in early first two years of life, which requires regular monitoring to detect early possible health problems and to administer intervention. [19] The Individuals with Disabilities Education Act (IDEA) shows children younger than 3 years of age (36 months) who are at risk of having developmental delays might be eligible for early intervention treatment services.[20]

Though many methods of early detection of developmental delay and growth failure are present, almost all professionals rely on clinical judgment. Some of the mechanisms are parent report, Parent recall of milestones/milestone checklists and Screening tests. Theory, policy, and clinical practice intersect and underscore the clear value and promise of clinical judgment or informed clinical opinion to address several purposes for evaluation in early intervention. [21] Health professionals should use screening, surveillance and monitoring charts for accurate identification of growth and developmental delay.

American Academy Pediatrics 2007 (AAP) recommends surveillance at every visit for well and sick child visits and standardized screening at 9 months, 18 months, 24 and/or 30 months and Pre-kindergarten. It also recommends autism screening separately at 18 and 24months. Research findings indicate though majority of the world countries accept the importance of using surveillance tools the practice of using the tools is low. Research findings also recommend the use of child development surveillance in the integrated management of child hood illness (IMCI) context. An intervention study with nurses conducted in Latin America on child development surveillance shows that 73% of nurses asked the opinion of mothers about their children's development and 91% nurses provide guidance to mothers on how to stimulate child development. Only 42% nurses used systematized instrument to evaluate child developmental status [22] studies give emphasis on the effectiveness of incorporating child development monitoring into primary health care. [23]

A literature reviews in India in early identification and assessment show, pediatricians frequently not referring eligible children for early intervention services. The study also showed clinicians with more experience have demonstrated difficulty in the identification of children with mild developmental delays. The use of appropriate developmental surveillance and screening for children helps to remember and decrease frustration in identification of growth and developmental problems. [24] [25] By adopting and incorporating developmental screening and surveillance in to office, practice physicians can ensure a systematic approach to children with developmental concerns and help improve their future. [26] Analysis on surveillance of child development conducted in Brazil shows that the percentage of filling out of the child development surveillance was 1.1%. [17] The result of the report shows health professionals have lack of belief in the importance of child developmental surveillance.

The study also reviews as healthcare practitioners in high-income countries relay heavily on the use of screening instruments to identify growth and developmental delay in children. Commonly practiced tools in USA include, Ages and Stages Questionnaire, Parents' Evaluation of Developmental Status, and the Denver Development Screening Test II, Connors ADHD Rating Scales, Modified Checklist for Autism in Toddlers, Autism Diagnostic Observation Schedule, and the Autism Spectrum Screening Questionnaire. Although there are limited data about availability of effective services, screening tools for use in LMICs are now emerging. Examples include using caregiver developmental reports in Kenya, the Malawi Developmental Assessment Tool, the Rapid Neurodevelopment Assessment Instrument in Bangladesh, and the Brisance developmental screening tool for aboriginal children in Australia. [27] In our country, Ethiopia there is lack of research findings in availability of surveillance tools and the practice of early child hood developmental assessment.

A study on worldwide implementation of WHO child growth standard shows by April 2011, 125 countries had adopted the WHO standards in to their local childcare service. Ethiopia is one of the countries who adopt and harmonize the standard fully. The study also reports majority of countries in Africa adopt weight-for-age (WFA), length/height-for-age (LHFA), weight-for-length/height (WFLH). Some countries in Africa practice BMI-for-age (BMIFA), head circumference-for-age (HC), mid upper-arm circumference-for-age (MUAC) with sex

specific charts. [28] Despite the adoption of WHO growth monitoring tools in Ethiopia, it was not well known about the practice and effectiveness of the service.

## 2.2 Review on Determinants of Child Growth and Developmental Assessment Practice

### 2.2.1 Socio-Demographic Characteristics

Study in Brazil on assessment of growth monitoring implementation analysis in childcare visits at the Family Health Strategy observes 119 visits for practice of growth monitoring by nurses only 38.9% of the nurses had job stability of at least two years and five of them reported, as they had not trained to work at PHC. [29]

A cross sectional descriptive survey study conducted in Cape Town on knowledge and perceptions of nursing staff on the new road to health booklet, growth chart 95 % of the respondents were female nurses and 69% were age younger than 50 years old. Majority of the nursing staff (74%) have more than 15 years' experience and only 10% working for less than two years. All of the nurses have got training on growth monitoring. [30]

A cross sectional descriptive study on knowledge and practices regarding child development among primary healthcare professionals in Brazil among the 31 professionals who answered the questionnaire, 24 had performed residence or specialization in the area of pediatrics, three in Clinical Medicine and four in Social Medicine / Health Public. 17 reported that have service in one or more services beyond the specific service unit of the municipality - emergency units (seven), units of hospitalization (three) and outpatient (ten).[31] An intervention study with nurses on child development surveillance shows, among 45 nurses who participated in this study, all were female predominantly aged between 41 and 50 years (42.2%). In relation to professional practice time, about half worked for 10 to 21 years, and the time of work in the family health service ranged between five and nine years (75.6%). [22]

A descriptive cross-sectional study with a population size of 3,105 PHC workers conducted in Nigeria, West Africa on primary Health Care Workers' Role in Monitoring Children's Growth shows, the respondents were between the ages of 15 and 60 years. Twenty nine

percent of the 372 respondents' ages ranged between 26-30 years and 21.8% between 36-40 years. (82.8%) respondents were females and (71.0%) were married. Of the respondents, (54.2%) were community, health extension workers (CHEWs), (31.7%) were nurses and (13.4%) were Doctors. In this study, questionnaires had self-administered by 372 respondents in 10 Health Centers in Local government areas. [32]

### 2.2.2 Professional, Facility and Service Variables on Child Developmental Assessment

Analysis on surveillance of child development conducted in Brazil shows that health professionals' and the population's lack of belief in the importance developmental assessment, which is the basic childcare. This analysis identifies difficulty of getting surveillance tools, the difficulties of the surveillance process, inadequate organization of the daily work of the teams, and the lack of knowledge about the instrument as challenges to practice and documentation of child developmental surveillance. The study also shows despite occurrence of prevalence in development delay in Brazilian children in different studies there was only one case of delay referral. This indicates poor practice in identification and referral of child with developmental delay. [33] Another study on Family Health Strategies in Joao Pessoa, in a study with 45 nurses and 450 mothers with kids younger than two years old found that that 15.8% of the health units did not have the community service counsel (CSC) and 75.4% did not have the development accompaniment norms. [17]

A review on global perspective in early diagnosis and intervention study describes, as there are multiple factors that influence the acceptance and practice of early detection and intervention. These include physician attitudes, awareness, insufficient training, and doubt about the value of early detection or non-acceptance of early treatment, and uncertainty about how or where to refer, time limitations of the clinic visit and inadequate reimbursement, and cost factors, concern about unnecessarily alerting a family and would prefer to wait until the problem is too obvious to ignore**.** [27] Systematic review examining the identification of developmental behavioral problems in primary care notes that, good developmental screening instruments, correctly identify more than 75% of children with problems.[34] Anticipatory

guidance based on the surveillance assessment data helps parents anticipate the next developmental stage and stimulate developmentally appropriate behaviors.[35]

A study on attitudes, practices, and barriers of primary care practitioners in screening emotional-behavioral problems in children shows that traditional techniques and clinical observation are the most commonly used with over 90 percent respondents endorsing non-standardized interviewing, review of systems. Consistent, universal use of these tools was only (2.6%). According to the study, the barriers that determine practice of using standard tools included lack of time (93%), lack of training in use of appropriate screening tools (88%), lack of mental health providers (79%), and lack of adequate personnel (77%). [18]

Another study conducted in Philadelphia on implementation and challenges of developmental screening shows as parents and clinicians perceived developmental screening favorably with overall good satisfaction with screening procedures. It also identifies lack of agreement on parent's assessments of child development, clinician preference to rely on their clinical acumen, and limited time, insurance reimbursement, and limited training on screening as barriers for the service. [36] Even though the practice of early child hood growth and developmental assessment in Ethiopia is not documented the prevalence of global, developmental delay and growth failure are significant public health problems as shown above.

### 2.2.3 Professional, Facility and Service Variables on Child Growth Assessment

Descriptive correctional study conducted in Nigeria on primary health care workers role in monitoring child growth and development shows that, " despite high level of awareness about growth monitoring and promotion(GMP)(95.2%), PHC workers have poor knowledge of procedures (49.2%, 30.6% and 29.3%) in the regularity of growth monitoring for children at 0-1 year, 1-2years and 2-5years of age respectively. Furthermore, 37.1% did not know at what point on the growth chart is intervention necessary, the appropriate advice to give the mothers. [32] In Ethiopia, the practice had not well known.

A hospital based descriptive cross-sectional study in south Africa on doctors' attitudes, knowledge and usage of growth charts find that (57%) of the doctors had high workloads,

(62.2%) doctors thought they were too busy to use growth charts, and only (41%) doctors achieved an acceptable total knowledge score on using growth charts. Although (67.8%) doctors reported a positive attitude towards growth monitoring, their reported usage does not reflect it**.** According to the finding, (60%) doctors plotted weights correctly. In the study, higher levels of knowledge (Fisher exact, p=0.005), a positive attitude towards growth charts (p=0.00003, Fisher exact), fewer years of experience (Fisher exact, p=0.015) and the perception that the workload was acceptable (Fisher exact, p=0.000033,) have the major factors associated with higher usage of growth chart. Out of doctors who reported usage of growth chart on a regular basis (72%) could plot the graph correctly, while only (42%) of the doctors who did not use the growth chart could accurately plot a child's weight on the chart. [37]

An evaluation survey on community based child growth monitoring and promotion in Zambia proves that community child growth monitoring and promotion (CCGMPs) were inadequately trained. [38] A community based cross-sectional study in Ethiopia on knowledge and attitude of mothers to wards growth monitoring shows, counseling and education from health professionals and a positive impact on knowledge and attitude towards of mothers to growth monitoring. The study finds out low knowledge status of the mothers. [39] Another qualitative study in Ethiopia on Practices and Challenges of Growth Monitoring and Promotion recommends a need to quantitative study on the level of knowledge and practice of growth monitoring strategies in health care workers. [40]

In general, the literatures show early assessment of child growth and development has paramount significance in timely detection and intervention of growth and developmental problems. On the other hand, it is the right of the children to receive a comprehensive health service and well developmental outcomes in their life. For the first time, the foremost global development framework, the new Sustainable Development Goals (SDGs) includes child development, under target 4.2.[41] This is also reflected in the new Global Strategy for Women's, Children's and Adolescents' Health (2016–2030).[42] Within that, one of the core objectives is to ensure that all women, children, and adolescents have an equal chance to thrive and not simply survive.

## 2.3. Conceptual frame work

The conceptual framework was adapted based on the literatures reviewed. The details of the framework were displayed in the figure 1 below. The arrows in the diagram show the relationship between the variables. As depicted in the diagram, practice of early child growth and developmental assessment might affect by socio-demographic characteristics, professional characteristics and facility and service variables.

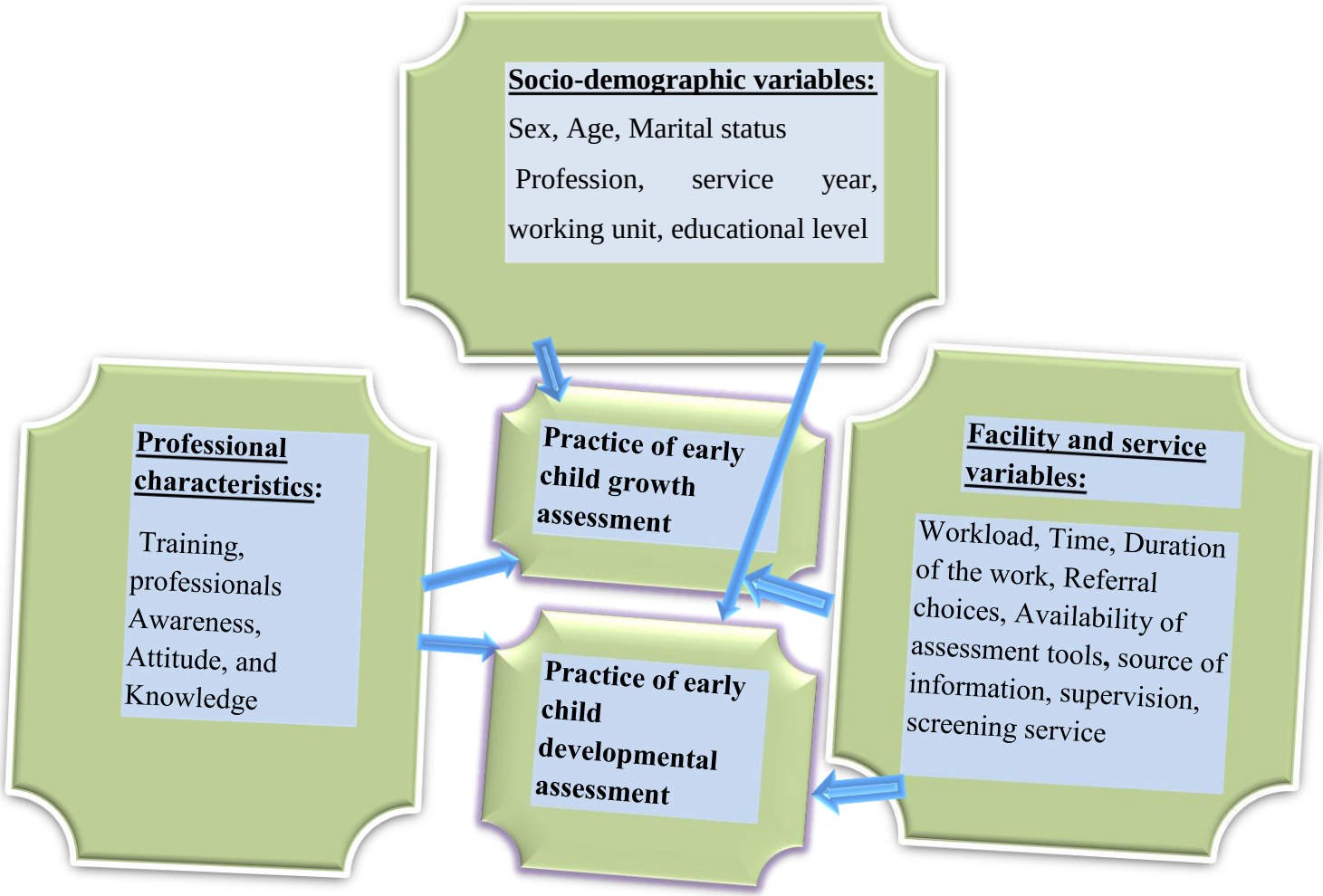



Figure 1 Schematic presentation of conceptual framework adapted from different literature. [22, 32, 36, 37]

# 3. OBJECTIVES

## 3.1. General Objective

To assess practice in early child hood growth and developmental assessment and its determinants among health professionals in selected public hospitals in Addis Ababa, Ethiopia, 2018.

## 3.2. Specific Objectives

To assess practice of early child hood growth assessment among health professionals in selected public hospitals in Addis Ababa, Ethiopia.

TO assess practice of early child hood developmental assessment among health professionals in selected public hospitals in Addis Ababa, Ethiopia.

To examine determinants associated with practice of early child growth assessment among health professionals in selected public hospitals in Addis Ababa, Ethiopia.

To examine determinants associated with practice of early child hood developmental assessment among health professionals in selected public hospitals in Addis Ababa, Ethiopia.

# 4. METHODS AND MATERIALS

## 4.1. Study Area and Period

This study was conducted in six selected public hospitals in Addis Ababa, Ethiopia from March to April 2018. Addis Ababa is the capital city of Ethiopia. It is the largest city in Ethiopia, established in 1887 by emperor Menilik II. It has the status of both a city and a state. Addis Ababa has ten sub-cities at which the City lies at an altitude of 7,546 feet (2,300metres). The city is surrounded by Oromia special zones in all directions. It has twelve governmental hospitals. From the 12 governmental hospitals six of them Black Lion, St. Paulos, Yekatit 12, Zewditu Memorial Hospital, Tirunesh Beijing Hospital and St, Petros Hospital are included in the study through simple random selection. All these hospitals provide service for children in different settings. (FMOH, 2008, 2012, 2014) There are 660, health professional's work at pediatric care settings in the selected hospitals.

## 4.2. Study Design

Facility based descriptive cross-sectional study design was used to assess the practice of early child hood growth and developmental assessment and its determinants among health professionals working in Public hospitals in Addis Ababa.

## 4.3. Source Population

All health care providers who are working in child care units in Addis Ababa public hospitals.

## 4.4. Study Populations

The populations used for this study were all health professionals who participated in childcare services in the selected public hospitals in Addis Ababa, Ethiopia.

## 4.5. Sample Population

Selected health professionals who are working in childcare units from the selected public hospitals in Addis Ababa, Ethiopia

## 4.6. Eligibility Criteria

### Inclusion Criteria

All health professionals worked more than six months and participate in child care units(under five OPD, pediatric ward, pediatric ICU, neonatal ward and ICU) at the selected public hospitals and available at the time of data collection were included.

## 4.7. Sample Size Determination and Sampling Procedure

#### 4.7.1. Sample Size Determination

A single population proportion formula was used to calculate the sample size by considering the following statistical assumptions:

P = proportion of practice of health professionals in child growth and development is 50% which yields maximum sample size because no corresponding studies in similar geographical area on these objectives.

(Z α/2 = the corresponding Z score of 95% CI)

d= Margin of error (5%)

$$N = \frac{(Z\frac{\alpha}{2})^2 \times p(1-p)}{(d)^2}$$

N= $(1.96)^2$ *0.05*0.05/ $(0.05)^2$ = 384.16. Since no decimal person, it was approximated to the upper number to increase the sample size and it becomes 385.

The final sample size was determined using the correction formula because the total study population is less than 10,000. Therefore, the final sample size were, nf= n/1+n/N = 385/1+385/660 = 385/1.584= 243. By adding 10 %, non-response rate the final total sample size was 267.

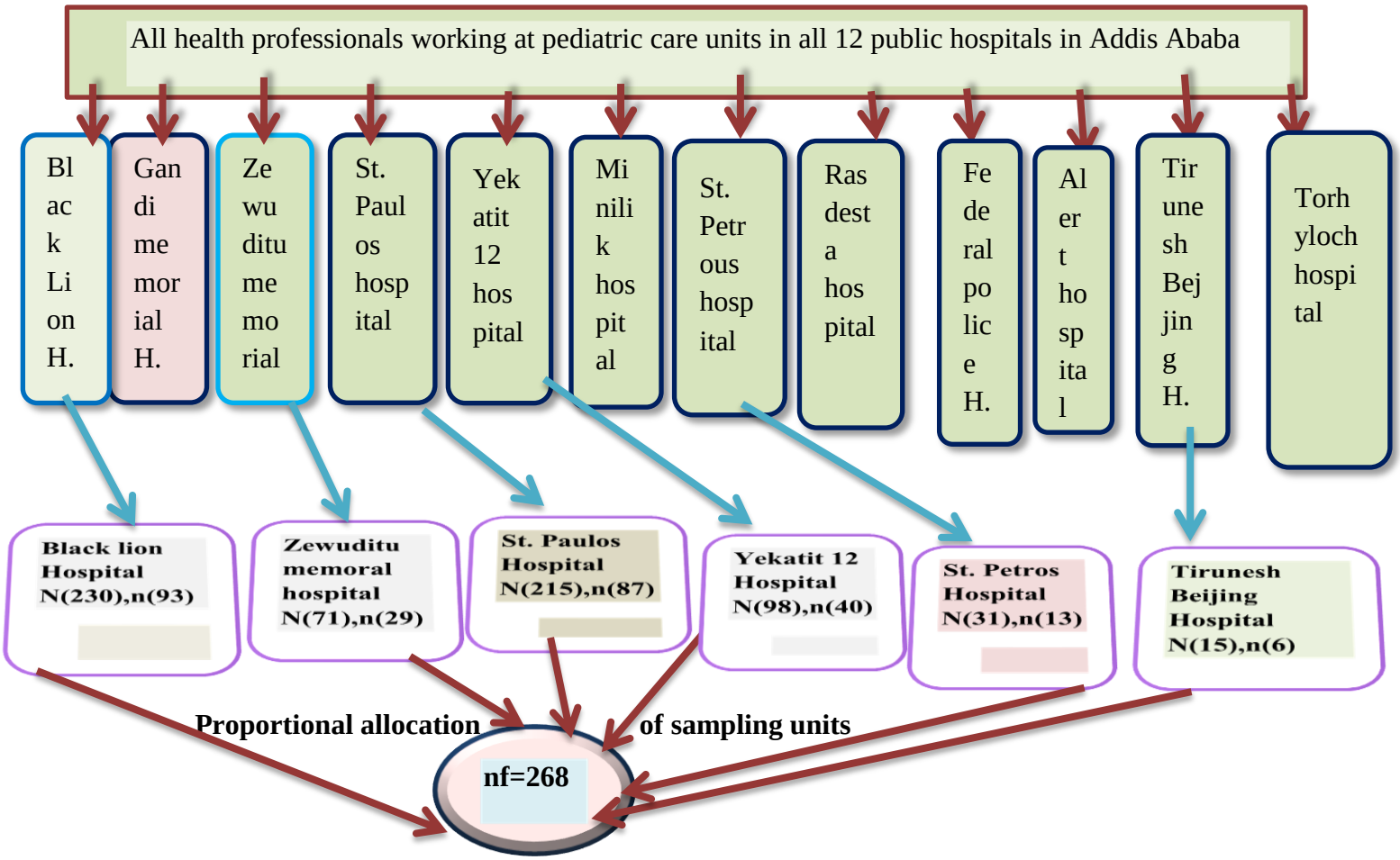
### 4.7.2. Sampling Procedure

Study populations were selected from six randomly selected public hospitals in Addis Ababa having pediatric care unit by using simple random selection technique. The sampling units were selected from each hospital by allocating the total sample proportionately. Based on the proportionate allocation the study units has selected as follows. Tirunesh Bejjing hospital = 6, Zewuditu Hospital 29, Black lion hospital = 93, Yekatit 12 Hospital 40, St.Petros Hospital 13, St. Pawulos Hospital = 87. Then the study units were determined by systematic random sampling technique after getting the sampling frame from the institutional lists. Separate K-interval has calculated to select sampling units from each selected hospitals as follows.

| **Name of hospitals** | **Tirunesh Bejjing Hospital** | **Zewditu hospital** | **Black Lion hospital** | **Yekatit 12 hospital** | **St. Petros Hospital** | **St. Pawulos Hospital** | **total** |
|---|---|---|---|---|---|---|---|
| **N** | 15 | 71 | 230 | 98 | 31 | 215 | 660 |
| **N** | 6 | 29 | 93 | 40 | 13 | 87 | 268 |
| **K= N/n** | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

N= total number of health professionals, n= number of sample population, K= sampling interval

During proportional allocation, decimal numbers were approximated and only one subject added to the actual sample size and it becomes 268. Figure two below shows schematic presentation of sampling procedure.




Systematic random sampling was used to select study units.

Figure 2: Schematic presentation of sampling procedure

## 4.8. Data Collection Procedure

Structured questionnaires were adapted from previous studies[22], [32], [36], [37]. The self-administered questionnaires and observational checklists have composed of questions on practice of health professionals in child growth and developmental assessment and questions addressing the socio-demographic, professional and institutional variables. Six health professionals with BSc degree and two supervisors with MSc who were working at childcare services from other hospitals out of the study units were recruited and trained for data collection and supervision. Self-administered questionnaire and observational checklist were conducted which had taken a total of 15 minutes. Selected health professionals were observed during procedural assessment and then the self-administered questionnaire were provided. The data collection process was closely supervised and **~5%** were re-collected at random by Principal investigator & supervisors to check the consistency and reliability. Data were collected in each hospital during the working time from March to April 30, 2018. When the study participants were absent or in other round session, the data collector rechecked at least three times on the appropriate time.

## 4.9. STUDY VARIABLES

### 4.10.1. Dependent variables

Health professionals practice on early childhood growth and developmental assessment.

### 4.10.2 Independent variables

**Socio-demographic variables:**

Sex, Age, marital status, Profession, service year, working unit, educational level

**Professional characteristics:**

- Training, Awareness, Attitude, Knowledge

**Facility and service variables:**

- Workload, Time, Duration of the work, Referral choices, Availability of assessment tools**,** source of information, supervision, screening service

## 4.10. Operational Definitions and Definition of Terms

**Early child hood:** in this study included children birth to the age of five years

**Growth and developmental assessment**: it is a continual process of observing, gathering, recording, and interpreting information to answer questions and make developmental and instructional decisions about children.

**Practice:** It refers to the appropriate behavior or action performed by pediatric health care providers about child growth and development assessment through the items of structured practice questionnaires in the observational checklist and those who scored above the average were considered having good practice and those who scored below the average having poor practice. In this study knowledge and attitude has assumed as independent variables and categorized in to average & above and below average based on the calculated mean score of the variables to see their association.

**Developmental surveillance:** an assessment of child developmental progress by skilled health professionals using standardized developmental assessment tools

**Developmental screening:** The use of a brief procedure or tool designed to evaluate whether a child may be at risk for a developmental delay and who may need further assessment to verify developmental and/or health risks at regular intervals in well childcare visits.

**Growth monitoring:** assessment conducted to observe and check the progress of children's physical growth over a period. Nutritional intervention measures and charts the weight of children from 0 to 5 years of age and uses this information to counsel parents so that they take actions to improve child's growth. (WHO, 2006)

**Health professional:** in this study refers to, a person who belongs to one of the learned professions in health and employed in the hospital and practicing in childcare services.

**Suspected developmental delay referral:** in this study includes, a well-child referred to home with counseling, consultation of other physicians when there was expectation of suspected developmental delay and when a child were referred to developmental related care centers.

**Phonotypical developmental alteration assessment:** refers assessment of dimorphic features either by observation or by using systematized instruments.

## 4.11. Data Quality Assurance

A questionnaire was adapted and modified for data collection. Eight experts (three from educational and five from clinical with pediatrics specialty) had evaluated the questionnaire for validity and consistency by filling Likert scale measurements. The questionnaire was modified based on the comments given and content validity index were calculated for each question and CVI less than 0.7 has rejected. The total content validity index was 0.955. Then pretest was done in 5% of the population in other hospital out of the study population (Minilik hospital and Ras Desta hospital) to measure the consistency and clarity of the questionnaire. Based on the pretest result, the questionnaires were modified and insured for clarities. Training for data collectors and supervisors was given. Strict supervision was held during data collection. Respondents were blinded during observation. Data cleaning was done immediately after the questionnaire was collected and a tool with less than 80% incomplete information was rejected. Data were cleaned and checked for completeness before data entry. Additional data cleaning and re-codding were done on SPSS. The reliability of the data was checked by calculating the Cronbach alpha test and it was 0.78. Multi collinearity among independent variables was assessed during the analysis. Work experience and age of health professionals have not multi Collinearity effect on practice with variance inflation factor (VIF)(1.163) and Tolerance of (0.860). Outliers were seen at Q-Q plot test to select the appropriate measure of central tendency. Hosmer and Limshew fitness test was seen to ensure the model fitness on multivariable analysis of the binary logistic regression and it was insignificant at the value of 0.716.

## 4.13. Data Processing and Analysis

Data was verified, coded and entered in to Epi Data Software, version 4.2 and then exported and analyzed by SPSS version 23 Software for descriptive statistics and bivariate and multivariate logistic regression (LR) analysis. Significant variables at ($P$ <0.25) detected at bivariate level were subsequently entered into Multivariate Logistic Regression model to control for possible confounding variables and to examine association. Significant association was seen at p<0.05. Strength of association was expressed using Odds Ratio (OR). Data was processed by carrying out simple descriptive statistics (mean and standard deviation) and frequency with percentage distribution.

## 4.14. Ethical Consideration

Ethical clearance was obtained from Addis Ababa University School of nursing and midwifery ethical review committee and then permission letter were obtained from the school. Letters of cooperation were written to Addis Ababa health bureau, Ethiopian ministry of health, each hospital administrative authority and other concerned bodies from the school of nursing and midwifery. Another ethical clearance was obtained from Addis Ababa public health research and emergency management core process. After getting cooperativeness letter from medical director of each hospital the department of pediatrics was requested to confirm the applicability of this study. Then study participants were asked for their willingness to participate in the study both by verbal and written consent form on the cover page of the questionnaire. All the reasons why the participants were chosen and why the research was conducted were explained to the study participants. Confidentiality was maintained by avoiding writing any personal identification on the questionnaire and the participants have noticed as they have the right not to participate in the study. No personal identification has been used on data collection & information was kept confidential. Study participants were aware neither they gain benefit nor harmed by the outcome and process of this study.

## 4.15. Dissemination of the Result

The result of the study will be submitted, presented and accessed to AAU, school of nursing and midwifery for partial fulfillment of the requirements to master's degree in pediatric and child health nursing. It will also be disseminated to AAHB and EMOH to provide baseline information about the health professionals' practice toward the delivery of quality health services in this specific area. The hospitals involved in the study will have the opportunity to get access of the results. The results will also be disseminated to Addis Ababa public health research and emergency management core process. The finding will also be presented in locally or internationally held seminars, workshops, conferences and meetings. Presentation on the scientific forum and Publication on the scientific journals will be processed in the future.

# 5. **Results**

## 5.1. socio-demographic characteristics of respondents

Two hundred and sixty eight checklists and questionnaires were observed, distributed, supervised and returned by data collectors, to make a response rate of 96.64% (n=259). The respondents were initially observed for their practice on child growth and developmental milestone assessment by observational checklist and then self-administered questionnaire were distributed at the same time. The respondents were between the ages of 20 and 50 years with a mean age of 30.4, SD ±5.8, [(Min, Max) (20, 48)]. Forty two point nine percent of the respondents' ages ranged between 26-30 years (n=110) and 20.1% between 20-25 years (n=52). One hundred and thirty three (51.4%) respondents were males and 142/259 (54.8%) were single in marital status. Of the respondents, 176 were nurses (54.2%), 34 were general practitioners (13.1%), 22 were health officers (8.5%), 19 were pediatricians (7.3%) and 8 were neonatologists (3.1%). Table (1) below shows frequency of socio- demographic variables

Table 1: Socio-demographic characteristics of health professionals working in public hospitals, Addis Ababa, Ethiopia (n= 259), 2018

| Variables | Frequency (n=259) | Percentage (%) |
|---|---|---|
| **Sex** | | |
| Male | 133 | 51.4 |
| Female | 126 | 48.6 |
| **Age** | | |
| 20-25 | 52 | 20.1 |
| 26-30 | 110 | 42.5 |
| 31-35 | 49 | 18.9 |
| 36-40 | 22 | 8.5 |
| >=41 | 26 | 10 |
| **marital status** | | |
| Married | 112 | 43.2 |
| Single | 142 | 54.8 |
| divorced | 5 | 1.9 |
| **Profession** | | |
| general practitioner | 34 | 13.1 |
| Pediatrician | 19 | 7.3 |
| Neonatologist | 8 | 3.1 |
| Health officer | 22 | 8.5 |
| Nurse | 176 | 68 |
| **work experience** | | |
| <1 year | 57 | 22 |
| 1-5 year | 131 | 50.6 |
| 6-10 year | 52 | 20.1 |
| >=11 | 19 | 7.4 |
| **highest level of education** | | |
| Diploma | 9 | 3.5 |
| Degree | 199 | 76.8 |
| Masters | 24 | 9.3 |
| Specialist | 27 | 10.4 |
| **working unit** | | |
| under five OPD | 53 | 20.5 |
| pediatrics ward | 65 | 25.1 |
| pediatrics emergency | 71 | 27.4 |
| pediatrics ICU | 13 | 5 |
| neonatal ICU | 57 | 22 |

## 5.2. Professional and service variables on child growth assessment

Thirty five percent of the respondents (n=91/259) got additional training on child growth assessment. Ninety one percent of the respondents who got additional training were in service in nature. Ethiopian ministry of health provided majority of the trainings (57%). Sixty five percent of the respondents who got additional training trained once. Fifty one percent of the respondents agree that average time to assess growth for one child is 15-30 minute. Majority of the respondents 71% (n=186) reported that the average workload per day was greater than eight hrs. Seventy seven percent of health professionals (n= 200) reported that availability of growth monitoring guideline on their practice area and 96% of them reported as they used the guideline for child growth assessment. From the respondents who reported usage of the growth assessment guideline 48 %( n=96) only get supervision on the use of the guideline and majority of the supervision were held by government (82%). *(Table: two)*

Table 2: Professional and service variables on child growth assessment practice working in public hospitals, Addis Ababa, Ethiopia, 2018

| Variable | Categories | Frequency (n=259) | Percentage (%) |
|---|---|---|---|
| **Frequency of growth and developmental assessment** | Always as routine | 177 | 68.3 |
| | Irregularly | 82 | 31.7 |
| **additional training got** | No | 168 | 65 |
| | Yes | 91 | 35 |
| **type of training** | In-service | 83 | 91 |
| | Pre-service | 8 | 9 |
| | Others | 0 | 0 |
| **training provider** | Ethiopian ministry of health | 52 | 57 |
| | NGO | 22 | 24 |
| | University as community service | 10 | 11 |
| | Others | 7 | 8 |
| **number of training taken** | One | 59 | 65 |
| | Two | 16 | 18 |
| | Three | 10 | 11 |
| | >=4 | 6 | 7 |
| **Average time to assess growth for one child** | <15 minute | 110 | 42 |
| | 15-30 minute | 132 | 51 |
| | 30-45 minute | 10 | 4 |
| | >45 minute | 7 | 3 |
| **Work load per day** | <=8hrs | 62 | 2 |
| | 8-16 hrs. | 133 | 51 |
| | 16-24 hrs. | 53 | 20 |
| | >=24 hrs. | 11 | 4 |
| **availability of growth monitoring guideline** | No | 59 | 23 |
| | Yes | 200 | 77 |
| **do you use the guideline** | No | 8 | 4 |
| | Yes | 192 | 96 |
| **supervision on child growth assessment** | No | 104 | 52 |
| | Yes | 96 | 48 |
| **source of supervision** | NGO | 13 | 14 |
| | Government | 79 | 82 |
| | Other | 4 | 4 |

## 5.3. Practice of health professionals on child growth assessment

The practice of health professionals on child growth assessment were observed using pre-prepared, validated and pretested observational check-list which have eleven components to be observed and filled by the data collector. There were 10 variables prepared specifically to measure the practice orderly. These includes growth assessment techniques used, procedures performed, growth measurement parameters assessed, explanation of the purpose to the parent, documentation of assessment findings, documentation chart used, counseling given based on the assessment result and type of counseling given. According to the observational checklist data 93.1% (n=241) of respondents assess the growth of children. The practice of health professionals on child growth assessment was categorized in to good and poor practice based on the calculated mean of the ten components of the checklist. According to this 38.2% (n=99) have good practice of child growth assessment at a mean 6.1 (SD= +/-0.487, (Max, Min) (4, 10). The bar graph below shows frequency poor and good practice of child growth assessment

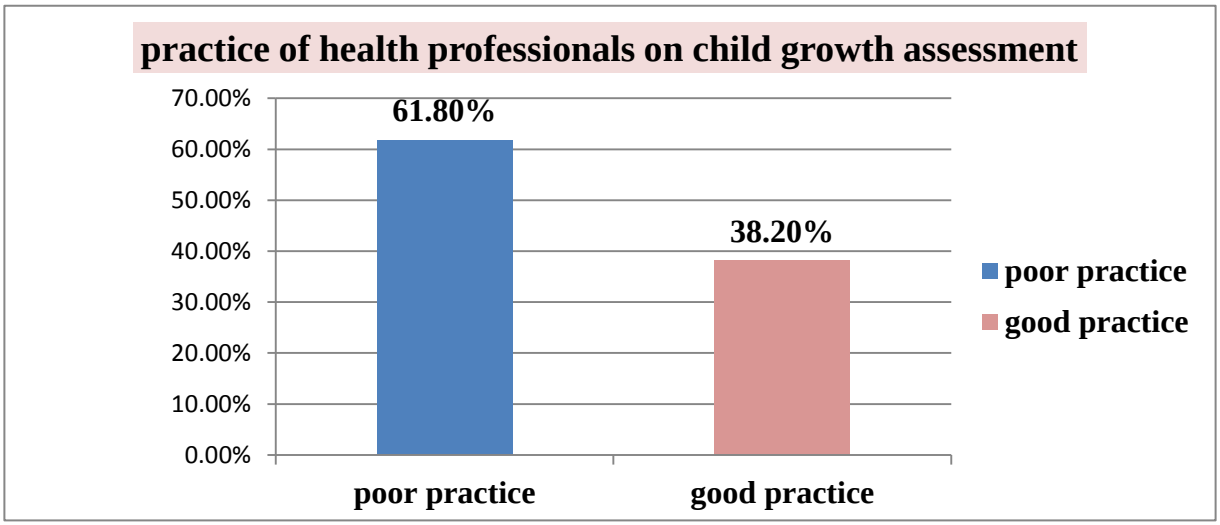



Figure 3: level of practice on child growth assessment among health professionals working in public hospitals, Addis Ababa, Ethiopia, 2018. (n=259)

Majority of health professionals n=239(98.8%) used growth measurement tool to assess the growth status of the child. The findings showed poor performance of procedures, i.e. only 5% of respondents clean the scale after each child weight measured. The table below shows frequency of responses to variables on practice of child growth assessment.

Table 3: Practice of health professionals on child growth assessment working in public hospitals, Addis Ababa, Ethiopia

| Variables | Categories | Frequency (n) | Percent (%) |
|---|---|---|---|
| **Child growth assessment done** | No | 18 | 6.9 |
| | Yes | 241 | 93.1 |
| **Growth assessment techniques used** | History from parent and child | 86 | 35.5 |
| | Head to toe physical examination | 10 | 4.1 |
| | Focused physical examination | 23 | 9.5 |
| | Growth measurement tools | 239 | 98.8 |
| **Procedures performed to assess the growth** | the scale is cleaned after each child is weighed | 12 | 5.0 |
| | the child is undressed to get accurate Wt. | 138 | 57.3 |
| | shoes, socks, and hair ornaments removed | 29 | 12.0 |
| | the length board is covered with a thin cloth | 17 | 7.1 |
| | imaginary vertical line from the ear canal to eye perpendicular to board | 44 | 18.3 |
| | gentle pressure is applied on the knee | 140 | 58.1 |
| **Growth measurements tools done** | Weight | 241 | 100 |
| | Length/height | 199 | 82.6 |
| | Head circumference | 92 | 38.2 |
| | mid upper arm circumference | 182 | 75.5 |
| | Chest circumference | 1 | 0.4 |
| **The purpose of the assessment is explained to the parent** | No | 201 | 83.4 |
| | Yes | 40 | 16.6 |
| **Child growth assessment findings documented** | No | 0 | 0 |
| | Yes | 241 | 100 |
| **Growth documentation chart used** | Infant /child primary health record | 1 | 0.4 |
| | Medical health record | 223 | 92.5 |
| | Percentile chart for weight& height | 5 | 2.1 |
| | Sex specific child growth recording sheet | 12 | 5.0 |
| **Growth measurement findings interpreted** | No | 100 | 41.5 |
| | Yes | 141 | 58.5 |
| **Interpretation result used for growth** | Weight-for-age chart | 70 | 49.6 |
| | Height-for-age chart | 28 | 19.9 |
| | Weight-for-height/length chart | 126 | 89.4 |
| | Head circumference chart | 51 | 36.2 |
| | body mass index for age | 4 | 2.8 |
| **Counseling on assessment findings given to the parents** | No | 141 | 58.5 |
| | Yes | 100 | 41.5 |
| **Type of counseling given** | feeding and nutrition | 97 | 97 |
| | growth status of her child | 84 | 84 |
| | when to return | 27 | 27 |
| | referral advantage | 3 | 3 |

**Note:** *some of the variables in the table (2, 3,4,7,9 &11) are categorized in to yes, no based on the mean score of the multiple answer questions in each variable*

## 5.4. Descriptive statistics on health professionals knowledge of child growth assessment

The knowledge of health professionals on child growth assessment was assessed by nine prepared multiple-choice questions. According to the total calculated mean 44.8 %( n=116) of health professionals have good knowledge at the mean of 5.08 with SD = ± 2.38 and (Max, Min) value of (0, 9). Pie chart and table-4 shows the descriptive statistics of health professionals' knowledge of child growth assessment. From the respondents who good knowledge of child growth assessment only 54.5 %( n=54) have good practice of child growth assessment**.**

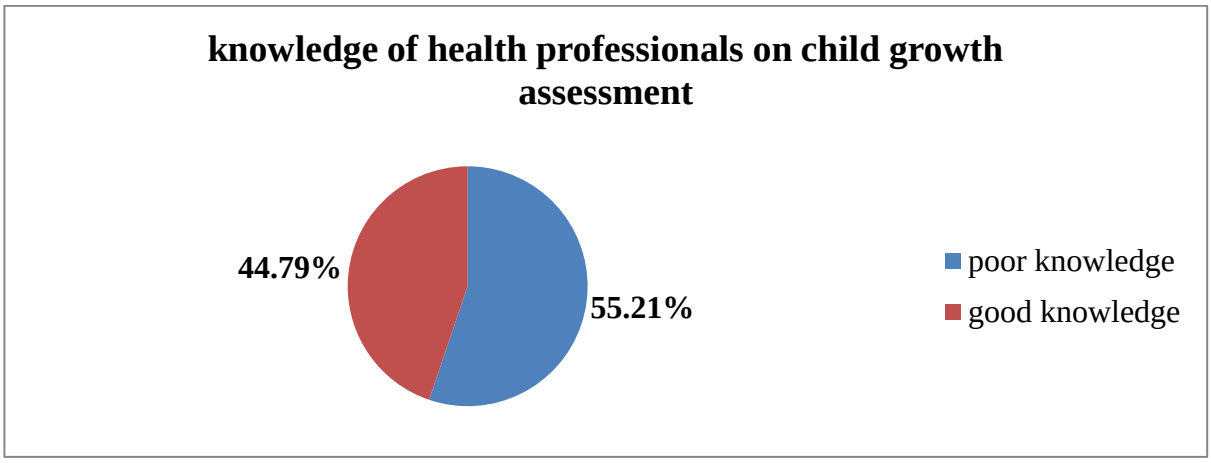



Figure 4: Knowledge of child growth assessment among health professionals working at public hospitals in Addis Ababa, Ethiopia

Table 4: Knowledge of health professionals on child growth assessment

| Variables | Categories | Frequency (n) | Percent (%) |
|---|---|---|---|
| **Reason for child growth assessment** | disturbance in health and nutrition affects growth | 157 | 60.6 |
| | expectation of potential growth problem | 150 | 57.9 |
| | to give anticipatory guidance for parents | 121 | 46.7 |
| | to diagnose malnutrition | 198 | 76.4 |
| | I do not know | 2 | 0.8 |
| **Recommended chart for growth measurement** | CDC growth chart | 90 | 34.7 |
| | WHO growth chart | 230 | 88.8 |
| | Harvard NCHS | 66 | 25.5 |
| | Local growth charts | 25 | 9.7 |
| | I do not know | 13 | 5.0 |
| **Time to discuss on change in child growth pattern** | At every healthy child visit | 126 | 48.6 |
| | At every sick child visit | 154 | 59.5 |
| | When there is a concern only | 77 | 29.7 |
| | I do not know | 7 | 2.7 |
| **Growth pattern difference in children** | It is the same in all children | 17 | 6.6 |
| | It may differ across sex | 152 | 58.7 |
| | It may differ based on breast feed status | 165 | 63.7 |
| | It may differ based on living status | 165 | 63.7 |
| | I do not know | 16 | 6.2 |
| **Knowledge of body mass index (BMI)** | It can screen overweight when >85 percentile alone | 96 | 37.1 |
| | It may be affected by children level of physical activity | 90 | 34.7 |
| | Important screening tool along with other growth assessment findings | 176 | 68 |
| | I do not know | 15 | 5.8 |
| **deviation of plotted line above the upper reference curve indicate** | Weight gain is normal and good | 52 | 20.1 |
| | Excess weight gain | 179 | 69.1 |
| | I do not know | 28 | 10.8 |
| **meaning of a plotted horizontal line after sickness of the child** | There is no problem | 18 | 6.9 |
| | Failure to grow due to infection | 203 | 78.4 |
| | I do not know | 37 | 14.3 |
| **lower limit of normal for birth weight** | Birth weight 3.5kg | 7 | 2.7 |
| | Birth weight 2.5kg | 224 | 86.5 |
| | Birth weight 1.5kg | 28 | 10.8 |
| **plan for Intervention** | Plotted line is between the two reference curves | 51 | 19.7 |
| | Plotted line is outside the two reference curves | 172 | 66.4 |
| | I do not know | 36 | 13.9 |

## 5.5. Descriptive statistics of health professional's attitude on child growth assessment

Attitude of health professionals towards child growth assessment were assessed using five Likert scale questions with five responses. Then after, mean response is used to say positive and negative attitude towards child growth assessment. Based on this, 56.4% (n=146) of health professionals have positive attitude towards child growth assessment at a mean score of 19.4, SD =± 4.54 and (Min, Max) value of (5,25). The bar chart below shows frequency of attitude of health professionals on child growth assessment

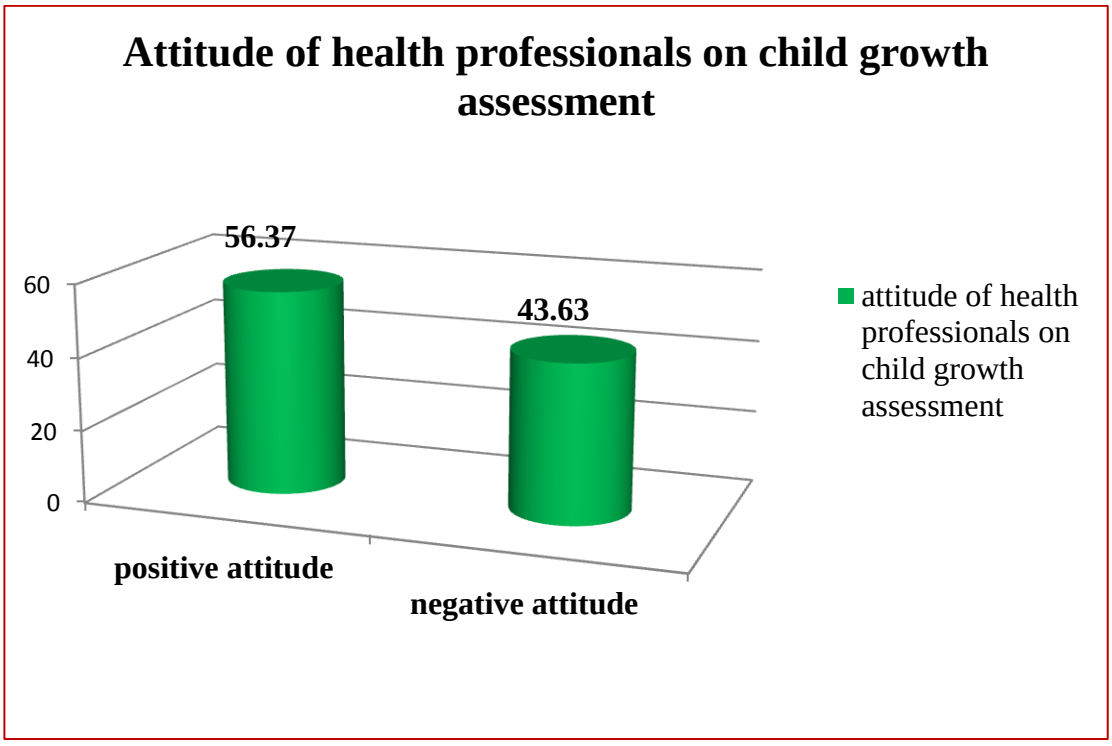



Figure 5: Attitude of health professionals towards child growth assessment in Addis Ababa public hospitals (n=259)

## 5.6. Determinants of early child hood growth assessment practice

Bivariate and multivariate logistic regression was performed to see the association of different determinant variables with health professionals practice to early child growth assessment. All variables that have association with the outcome variables in bivariate logistic regression analyses at P= 0.25 were included in the multiple logistic regression models. After controlling for the effects of potentially confounding variables using multiple logistic regression: sex, profession, work experience and additional training on child growth assessment remained significantly associated with health professionals practice towards early child hood growth assessment practice at ($p< 0.05$).

Determinants associated with health professionals practice in early child hood growth assessment, females were more than two times (AOR = 2.025, 95%CI: 1.012-4.037) more likely to practice child growth assessment than males at a P-value of 0.046. Of the professionals general practitioners were seven times more likely to practice early child hood growth assessment than nurses at (AOR = 7.416, 95%CI:2.455-22.401) at P = 0.000 & pediatricians were more than thirteen times more likely to practice early child hood growth assessment than nurses at [(AOR = 13.06, 95% CI:(1.125-151.47) at p = 0.001.].

Health professionals with work experience greater than 11 years were more than seven times practice early child hood growth assessment than those who are less than one year work experience at P=0.005 [AOR =7.281, 95%CI:1-53.171)]. Health professionals who got additional training on child growth assessment were about four times more likely to practice early child hood growth assessment than those who did not get additional training at P = 0.001 [AOR =3.97, 95%CI: (1.585-6.445)]. Table 5 shows the crude and adjusted odds ratio of variables associated at $P< 0.25$ and $P< 0.05$ respectively.

Table 5: determinants of health professionals practice on early childhood growth assessment

| | | Practice of child growth assessment | | OR (95%CI for OR) | |
|---|---|---|---|---|---|
| **Variable** | **Category** | **Good practice** | **Poor practice** | **COR at P< 0.25** | **AOR at P< 0.05** |
| **Age of health professionals** | 26-30 years | 34 | 76 | .536 (.207-01.388) | .481(.206-1.124) |
| | 31-35 years | 23 | 26 | .383 (0.161-0.916) | .823 (.273-2.477) |
| | 36-40 years | 8 | 14 | .758 (0.292-1.968) | .229 (.046-1.145) |
| | >=41 years | 14 | 12 | .490 (0.153-1.565) | .197 (.023-1.719) |
| | **20-25 years** | 20 | 32 | 1 | 1 |
| **Sex** | Female | 42 | 84 | 1.500 (.905-2.486)* | 2.021 (1.012-4.037)* |
| | **Male** | 57 | 76 | 1 | 1 |
| **Profession** | General practitioner | 25 | 9 | 8.086 (3.513-8.615)*** | **7.416 (2.455-22.401)*** ** |
| | pediatrician | 14 | 5 | 8.151 (2.78-23.90)*** | **13.06 (1.125-151.47)** ** |
| | neonatologist | 5 | 3 | 4.852 (1.115-21.12)* | 2.718 (.214-34.528) |
| | health officer | 10 | 12 | 2.426 (.981-5.996) | 1.727 (.401-7.429) |
| | **nurse** | 45 | 131 | 1 | 1 |
| **Work experience with young children** | 1-5 year | 53 | 78 | .213(0.070-0.651) | 1.098 (0.487-2.475) |
| | 6-10 year | 15 | 37 | .314(0.112-0.877) | 1.125 (0.308-4.105) |
| | >=11 year | 13 | 6 | .187(0.060-0.584)** | **7.281 (1.997-53.171)** ** |
| | **Less than one year** | 18 | 39 | 1 | 1 |
| **Educational level** | Degree | 74 | 125 | .120(0.020-0.710) | 0.968 (.167-5.609) |
| | masters | 4 | 20 | .249(0.104-0.598) | 0.304(.030-3.084) |
| | specialist | 19 | 8 | .084(.022-0.326)* | |
| | **diploma** | 2 | 7 | 1 | 1 |
| **Working unit** | Under five OPD | 30 | 23 | 2.905(1.386-6.091)** | 1.175(0.434-3.177) |
| | Pediatrics ward | 22 | 43 | 1.140(.555-2.339) | 1.178 (0.473-2.934) |
| | Neonatal ICU | 23 | 34 | 1.507(.726-3.127) | 1.148 (0.475-2.773) |
| | Pediatrics ICU | 2 | 11 | .405(.083-1.983) | .167 (0.021- 1.308) |
| | **Pediatrics emergency** | 22 | 49 | 1 | 1 |
| **Frequency of growth assessment** | Always as routine | 77 | 100 | 2.100 (1.185-3.720)* | 1.906 (0.884-4.109) |
| | **Irregularly** | 22 | 60 | 1 | 1 |
| **Additional training** | Yes | 51 | 40 | **.314(0.184-0.534)*** ** | **3.97 (1.585-6.445)** ** |
| | No | 48 | 120 | **1** | **1** |
| **Availability of growth equipment** | Average and above | 64 | 87 | 1.534 (.916-2.571) | .836 (0.412-1.694) |
| | **Below average** | 35 | 73 | 1 | 1 |
| **Workload per day** | <= 8 hr. | 29 | 33 | 1.594 (.895-2.842)* | 1.442 (.674-3.086) |
| | > 8 hr. | 70 | 127 | 1 | |
| **Knowledge on child growth assessment** | Average and above | 54 | 62 | .527(0.317-0.876)* | .788 (.378-1.645) |
| | Below average | 45 | 98 | 1 | 1 |
| **Attitude on child growth assessment** | Average and above | 64 | 98 | 2.100 (.665-6.633)* | 1.294 (0.34-4.931) |
| | **Below average** | 35 | 62 | 1 | 1 |

**Note:** *COR =crude odds ratio, AOR = adjusted odds ratio, CI = confidence interval at 95%, * = significant variables at P <0.05, ** = significant variables at P< 0.01, ***= p<0.001*

## 5.7. Professional and institutional variables on child developmental milestone assessment

From N= 259 respondents, majority 84.9% (n=220) health professionals reported that they assess children for developmental disorder in their childcare practice setup. Majority of them 58.6% (n=129) reported as they apply child developmental assessment at all well and sick child visit. Majority of health professionals 88% got information on child developmental assessment in college education and only 22.8% (n=59) health professionals got additional training on child developmental assessment and 44.1% (n=26) them trained by university educators as project. Majority of health professionals 62.2% (n=161) appoint children for developmental screening and 30.9% (n=50) reported as they appoint children for developmental screening only when previous developmental assessment demonstrates risk. Only 36.7% (n=95) respondents reported as they use standardized developmental screening tool to assess the developmental status of the child and 56.25% of them use ages and stages questionnaire tool for developmental assessment. Table-6 below shows frequency of responses to professional and service variables on child developmental milestone assessment

Table 6: Frequency of institutional variables on child developmental milestone assessment among health professionals working at public hospitals (n=259)

| Variables | Categories | Frequency (n) | Percentage (%) |
|---|---|---|---|
| assess children for developmental disorder in your practice setup | No | 39 | 15.1 |
| | Yes | 220 | 84.9 |
| when do you apply the process of developmental assessment | At all visits (well and sick) | 129 | 58.6 |
| | At all well visits | 16 | 7.3 |
| | At selected visits | 31 | 14.1 |
| | Whenever a parental concern is expressed | 44 | 20.0 |
| get training on child development assessment in your practice | No | 200 | 77.2 |
| | Yes | 59 | 22.8 |
| who provide you the training | Ethiopian ministry of health | 19 | 32.2 |
| | NGO | 14 | 23.7 |
| | University educators as project | 26 | 44.1 |
| number of training on child developmental assessment | One | 41 | 69.5 |
| | Two | 11 | 18.6 |
| | Three | 4 | 6.8 |
| | >=four | 3 | 5.1 |
| appoint children for developmental screening | No | 98 | 37.8 |
| | Yes | 161 | 62.2 |
| age of child the screening is applied | At regular interval( 9,18, 24,30,36 month ) | 45 | 27.8 |
| | At every well-child visit | 15 | 9.3 |
| | At every sick child visit | 45 | 27.8 |
| | previous developmental assessment demonstrates risk | 50 | 30.9 |
| | Whenever a parental concern is expressed | 7 | 4.3 |
| standardized developmental assessment tool in your set up | No | 164 | 63.3 |
| | Yes | 95 | 36.7 |

Bar chart below shows the frequency of respondents to source of information on child developmental milestone assessment

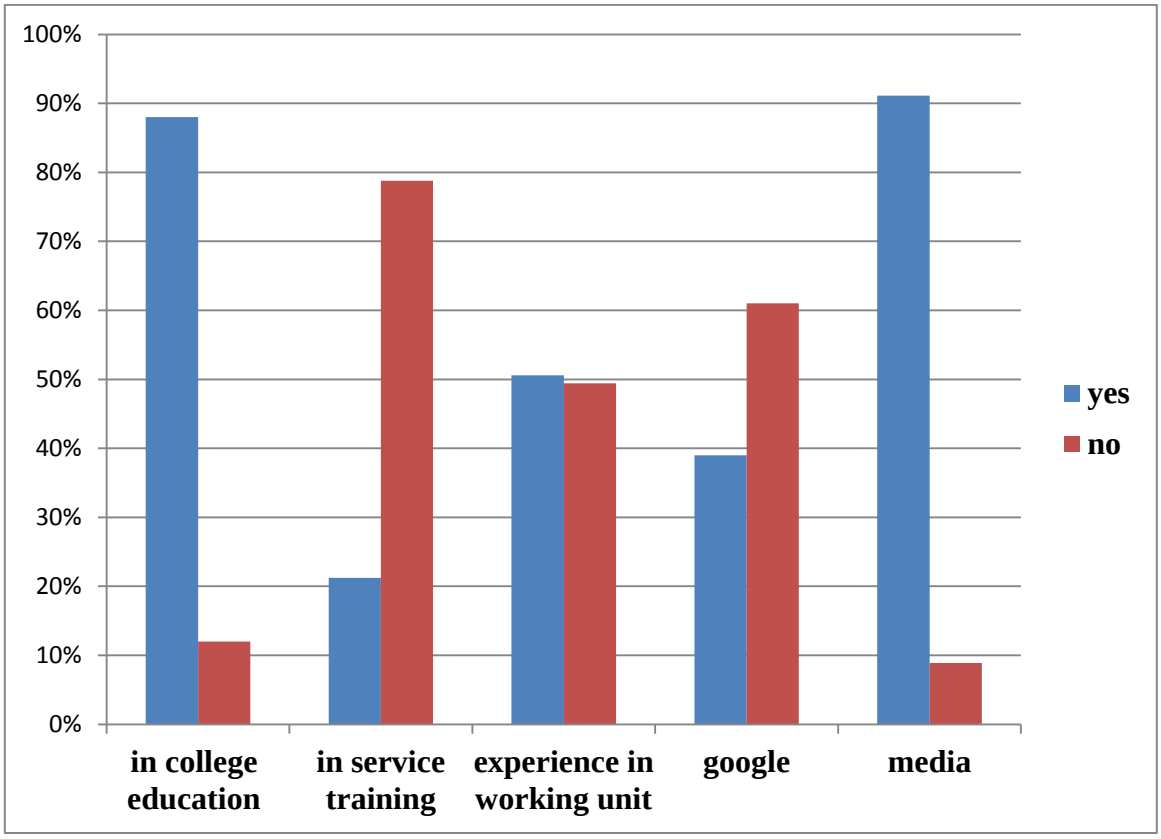



Figure 6: Source of information on child developmental milestone assessment (n=259)

Stacked bar chart below shows frequency of child developmental milestone assessment tools used by health professionals

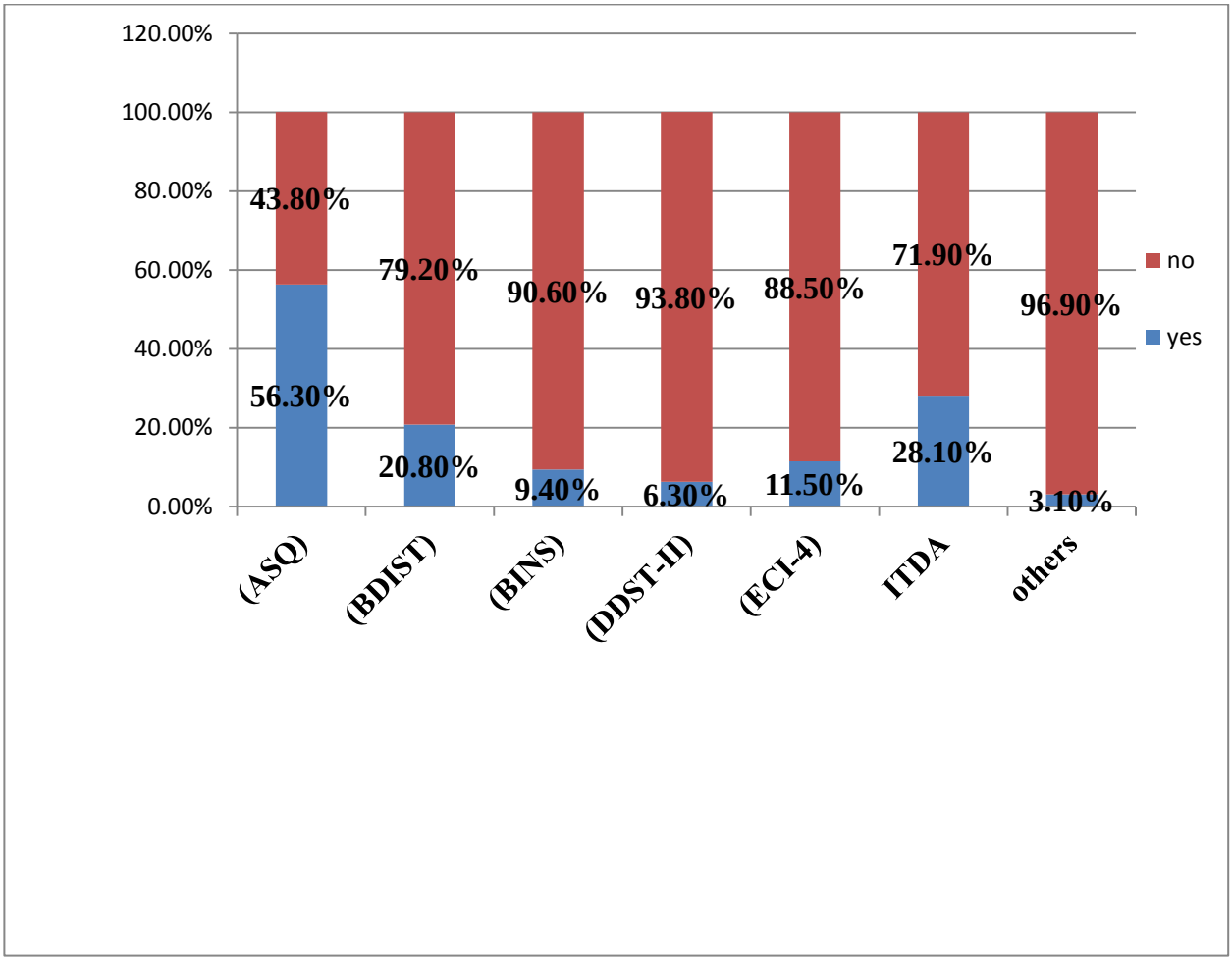



Figure 7: Developmental assessment tool used by health professionals working at public hospitals in Addis Ababa, Ethiopia, 2018

**Note:** ***ASQ*** *= Ages and Stages Questionnaire*

***BDIST*** *= Battle Developmental Inventory and Screening Test*

***BINS*** *= Bayley Infant Neuro-Developmental Screening*

***DDST-II*** *= Denver Developmental Screening Test- II*

***ECI-4*** *= Early Child Hood Inventory -4*

***ITDA*** *= Infant- Toddler Developmental Assessment*

## 5.8. Health professionals awareness on child developmental screening and surveillance service

Majority of health professionals 78.4% (203) reported as they have information on child developmental screening and surveillance service, but 81.8% (n=166) of them correctly define the type of service as regular age appropriate developmental assessment by health professionals. Thirty five percent n=91 of health professionals reported as they hear child developmental screening and surveillance service in Ethiopia. Based on profession, all neonatologists and pediatrician correctly define developmental screening and surveillance service as regular age appropriate developmental assessment by health professionals but nurses 75%.

Table 7: Awareness of health professionals on child developmental screening and surveillance working at public hospitals in Addis Ababa, Ethiopia (n=259), 2018.

| Variable | Categories | general practitioner | | Pediatrician | | neonatologist | | health officer | | Nurse | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | f(n) | P (%) | f(n) | P (%) | f(n) | P (%) | f(n) | P (%) | f(n) | P (%) |
| **Heard about child developmental screening and surveillance service** | No | 8 | 23.5 | 1 | 5.3 | 0 | 0.0 | 0 | 0.0 | 47 | 26.7 |
| | Yes | 26 | 76.5 | 18 | 94.7 | 8 | 100 | 22 | 100 | 129 | 73.3 |
| **Type of service** | A regular age appropriate developmental assessment by health professionals | 25 | 96.2 | 18 | 100 | 8 | 100 | 18 | 81.8 | 97 | 75.2 |
| | A health care service for children with mental illness | 1 | 3.8 | 0 | 0.0 | 0 | 0 | 4 | 18.2 | 32 | 24.8 |
| **Heard child developmental screening and surveillance service in Ethiopia** | No | 20 | 58.8 | 17 | 89.5 | 7 | 87.5 | 12 | 54.5 | 112 | 63.6 |
| | Yes | 14 | 41.2 | 2 | 10.5 | 1 | 12.5 | 10 | 45.5 | 64 | 36.4 |

## 5.9. Knowledge of health professionals on child developmental assessment

Health professional's knowledge on child developmental milestone assessment was assessed by twenty-one questions divided in to five parts based on the milestone. Highest knowledge score were seen in physical development domain 58% (n=150) have good knowledge on physical development with the mean value of 2.64 and above, SD= ± 1.08, [(Min, Max) (0, 4)]. Low knowledge score were gathered in cognitive development with only 21.2% (n= 55) score average and above with a mean value of one, SD = ± 0.704, [(Min, Max) (0, 3)]. In social developmental milestone domain 48.3% (n=125) scored above the mean value of 1.67, SD = ± 1.123, [(Min, Max) (0, 5)]. Regarding emotional and language developmental domain 42.5% (n=110), 45.9% (n = 119) scored average and above with the same mean value of 1.47, SD = ± 0.967, 0.733 and [(Min, Max) (0, 5), (0, 3)] respectively. Overall, 39.4% (n= 102) health professionals have good knowledge of child developmental milestone assessment with a mean value of 2.15, SD = ± 1.214, [(Min, Max) (0, 5)]. Table -8 below shows the frequency of correct responses at each developmental milestone domain with specific and total mean score. Table 8 below shows the frequency of responses to knowledge assessing variables on child developmental milestone.

Table 8: Knowledge of health professionals on early child hood developmental milestone assessment

| Developmental domain or milestone | Correct answer | Correct response n (%) | Mean and above correct n (%) |
|---|---|---|---|
| **Physical development** | | | 2.64+/4 correct n=150 (58%) |
| Reach for objects | 4-6 month | 95 (36.7%) | |
| Crawl | 6-12 month | 175 (67.6%) | |
| Walk | 12-18 month | 202 (78%) | |
| Dress themselves | 24-36 month | 214 (82.6%) | |
| **Cognitive development** | | | 1+/3 correct n=55 (21.2%) |
| Engage in pretend play | 12-18 month | 72 (27.8%) | |
| Follow simple instructions | 12-18 month | 65 (25.1%) | |
| Begin counting | 24-36 month | 120 (46.3%) | |
| **Social development** | | | 1.67+/5 correct n=125(48.3%) |
| Begin parallel play | 18-24 month | 48 (18.5%) | |
| Share toys | 36-60 month | 83 (32%) | |
| Play alone for 1 hr. | 36-60 month | 74 (28.6%) | |
| Need to have best friends | 60-72 month | 91 (35.1%) | |
| Show empathy | >72 month | 136 (52.5%) | |
| **Emotional development** | | | 1.47+/5 correct n=110(42.5%) |
| Manifest differential cries | 4-6 month | 31 (12%) | |
| Create bond with care giver | 4-6 month | 38 (14.7%) | |
| Recognize others emotion | 6-12 month | 71 (27.4%) | |
| Exert independence | 12-18 month | 59 (22.8%) | |
| Advocate for fairness | 60-72 month | 183 (70.7%) | |
| **Language development** | | | 1.47+/4 correct n=119 (45.9%) |
| First social smile | 4 months | 30 (11.6%) | |
| Start saying first words | 6-12 month | 175 (67.6%) | |
| Babbling sounds | 6 months | 93 (35.9%) | |
| Expressive language at 18 month | sentence of two words | 85 (32.8%) | |
| All knowledge domains | | | 2.15+/5 correct n=102 (39.4%) |

*Note: SD = standard deviation, Max = maximum value, Min = Minimum value*

## 5.10. Practice of health professionals on child developmental milestone assessment

The practice of health professional on child developmental milestone assessment was assessed by observational checklist with fifteen components. Of which seven questions are directly related to the practice, which the mean value was calculated. These include parents asked their opinion on child development, child developmental risk factors assessed, look for phonotypical developmental alteration, standardized screening tool use, developmental delay classified, suspected developmental delay referred, parents get counseling based on assessment findings. From n=259 participants only 28.6% (n=73) assess the child for developmental milestone status. Of those who perform the assessment 82.2 % (n= 60) asks child developmental risk factors. Feeding and nutritional pattern, gyni obstetric risk factors and family history of mental illness are the frequently assessed developmental risk factors with a frequency of ( 88.3%, 75%, 70%) respectively. 13.7% ( n=10) of the health professional who assess the child developmental status uses standardized developmental screening tool as guide for reference. Seven (70%) of those who use the assessment tool had gotten the assessment tool from their mobile. There is no standardized child developmental assessment tool put as hard copy for office reference. Table 9 below shows frequency of responses on the practice assessing variables.

Table 9: Child developmental milestone assessment practice among health professionals working in public hospitals in Addis Ababa, Ethiopia (n=259), 2018

| Variables | Categories | Frequency (n) | Percentage (%) |
|---|---|---|---|
| **Child developmental assessment is done** | No | 185 | 71.4 |
| | Yes | 73 | 28.6 |
| **Parents asked their opinion on his/her child development** | No | 1 | 1.4 |
| | Yes | 72 | 98.6 |
| **Child developmental risk factors assessed** | No | 13 | 17.8 |
| | Yes | 60 | 82.2 |
| **Phonotypical developmental alteration assessed** | No | 39 | 53.4 |
| | Yes | 34 | 46.6 |
| **Development assessed by standardized screening tool** | No | 63 | 86.3 |
| | Yes | 10 | 13.7 |
| **Source of the assessment tool** | Hard copy for office reference | 0 | 0 |
| | His own mobile | 7 | 70 |
| | Search from the intern ate at that time | 1 | 10 |
| | Books in electronic device | 2 | 20 |
| **Technique used to assess child development** | History from parent and child | 50 | 68.5 |
| | Physical examination | 10 | 13.7 |
| | personal screening guide | 30 | 41.1 |
| | age appropriate milestone | 40 | 54.8 |
| **Child classified for developmental delay** | No | 25 | 34.2 |
| | Yes | 48 | 65.8 |
| **Classification system done** | The IMCI contexts developmental classification | 2 | 4.1 |
| | Clinical diagnosis | 47 | 95.9 |
| **Child with suspected developmental delay referred** | No | 53 | 72.6 |
| | Yes | 20 | 27.4 |
| **Source of reference to refer suspected developmental delay** | The IMCI guide classification | 1 | 4.8 |
| | Developmental delay referral algorithm in office | 2 | 9.5 |
| | Medical referral form | 18 | 85.7 |
| **Parents get counseling based on assessment findings** | No | 12 | 16.4 |
| | Yes | 61 | 83.6 |

The overall practice was categorized in to poor and good practice based on the calculated mean value. Therefore, from n=259, 27.8% (n= 72) health professionals have good practice of early child hood developmental assessment with a mean value of 1.46, SD = ± 2.4, [(Min, Max) (0, 8)]. Bar chart below shows frequency of good and poor practice on child developmental milestone assessment.

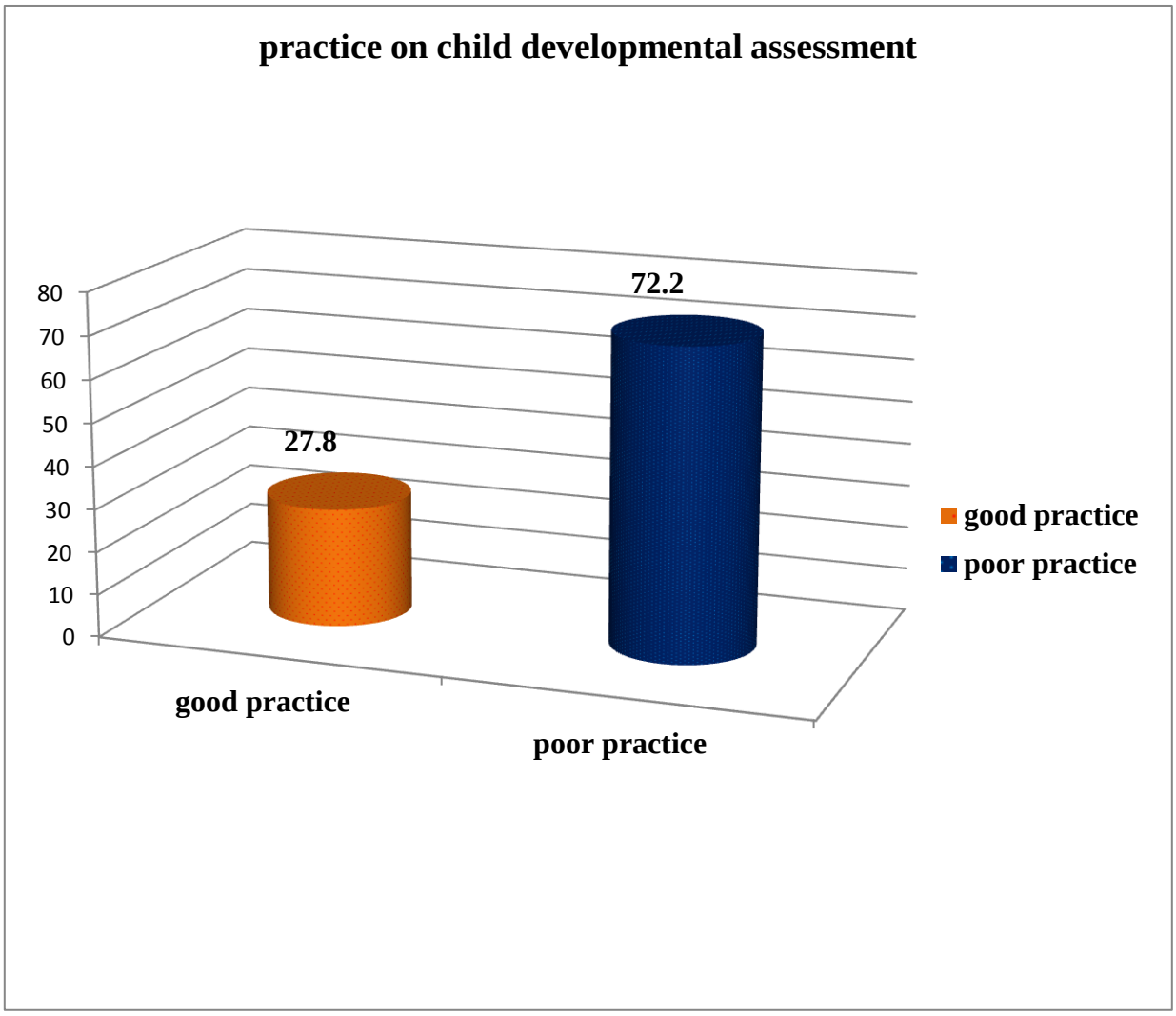



Figure 8: Practice of health professionals on early child hood developmental assessment

The stacked bar chart below shows frequency of child developmental risk factor assessment by health professionals who perform the child developmental assessment with n= 74.

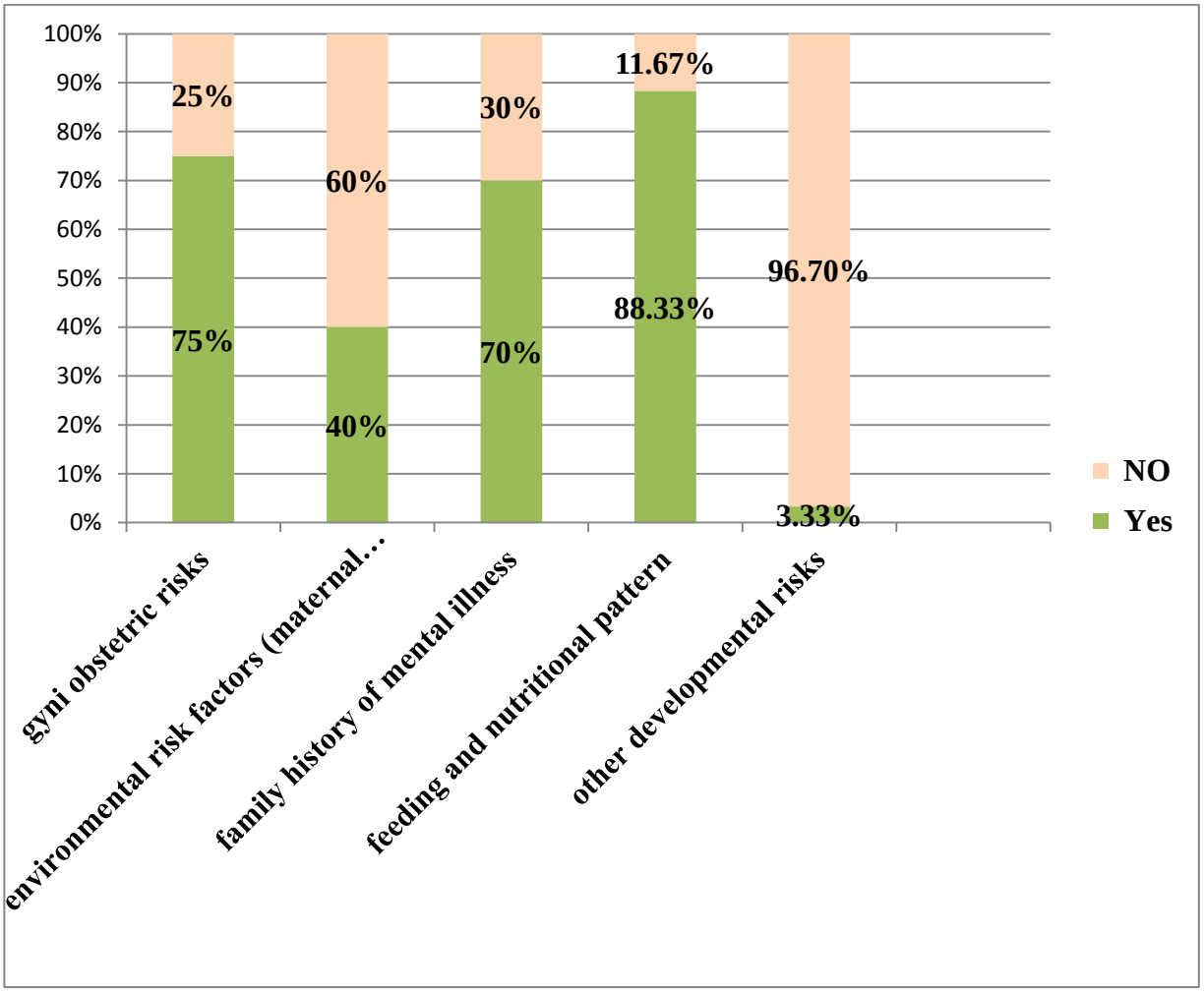



Figure 9: Frequency of child developmental risk factors assessed by health professionals working at public hospitals in Addis Ababa, Ethiopia, 2018, (n=259)

## 5.11. Determinants of early child hood developmental assessment practice

Bivariate and multivariable logistic regression was performed to see the association of different determinant variables with health professionals practice to early child developmental milestone assessment. All variables that have association with the outcome variables in bivariate logistic regression analyses at P= 0.25 were included in the multiple logistic regression models. After controlling for the effects of potentially confounding variables using multiple logistic regression only two variables (profession and work experience) remained significantly associated with health professionals practice towards early child hood developmental milestone assessment practice at ($p< 0.05$). from the professionals, general practitioners were more than twenty three times more likely to practice early child hood developmental milestone assessment than nurses at (AOR = 23.826 ,95%CI: 6.77- 83.9) at P = 0.000. In addition, health officer professionals were more than eleven times more likely to perform the practice than nurses at (AOR = 11.02, 95%CI: 2.1-58.812) at P-value = 0.005. health professionals with work experience greater than 11 years were more than twenty times practice of early child hood developmental assessment than those who are less than one year work experience at P-value =0.024 [AOR =20.897, 95%CI: 1.5-291.49). Table: 10

Table 10: Determinants on practice of health professionals in child developmental milestone assessment working in public hospitals, Addis Ababa, Ethiopia, (n=259), 2018.

| Variable | Category | Poor practice | Good practice | COR at P<0.25 | AOR at P<0.05 |
|---|---|---|---|---|---|
| **Age of health professionals** | 26-30 years | 90 (48.1%) | 20 (27.8%) | .066 (0.020-0.224)** | 1.266(.289-5.545) |
| | 31-35 years | 29 (15.5%) | 20 (27.8%) | .139 (.055-0.351)*** | 3.793 (.759-18.941) |
| | 36-40 years | 11 (5.9%) | 11 (15.3%) | .431 (.163-1.142)*** | 1.370 (.159 -11.793) |
| | >=41 years | 10 (5.3%) | 16 (22.2%) | .625 (.198-1.974) | .193 (.010-3.587) |
| | 20-25 years | 47 (25.1%) | 5 (6.9%) | 1 | 1 |
| **Sex** | Female | 97 (51.9%) | 29(40.3%) | .626 (.361-1.086)* | 0.733-0.273 |
| | Male | 90 (48.1%) | 43 (59.7%) | 1 | 1 |
| **Profession** | General practitioner | 11 (5.9%) | 23 (31.9%) | 22.45 (9.19-54.78)*** | **23.826 (6.77-83.9)*** ** |
| | pediatrician | 0 (0.0) | 19 (26.4%) | 17.077(0.194-121.23) | 15.077(.3194-71.86) |
| | neonatologist | 3 (1.6%) | 5 (6.9%) | 17.89 (3.89-82.29)*** | 8.034 (.373-173.212) |
| | health officer | 12 (6.4%) | 10 (13.9%) | 8.94 (3.32-24.12)*** | **11.02 (2.1-58.812)**** |
| | nurse | 161 (86.1%) | 15 (20.8%) | 1 | 1 |
| **Work experience with young children** | 1-5 year | 102 (54.5%) | 29 (40.3%) | 1.336 (.602-2.967) | .542 (.154-1.909) |
| | 6-10 year | 32 (17.1%) | 20 (27.8%) | 2.937 (1.216-7.096)* | 2.659 (.547-12.926) |
| | >=11 year | 6 (3.2%) | 13 (18.1%) | 10.18 (3.12-33.3)*** | **20.897 (1.5-291.49)*** |
| | < 1 year | 47 (25.1%) | 10 (13.9%) | 1 | **1** |
| **Educational level** | Degree | 155 (82.9%) | 44 (61.1%) | 2.271 (.277-18.650) | .228 (.021-2.421) |
| | masters | 21 (11.2%) | 3 (4.2%) | 1.143 (.103-12.664) | .058 (.003-1.105) |
| | specialist | 3 (1.6%) | 24 (33.3%) | 64.00 (5.80-705.8)** | |
| | diploma | 8 (4.3%) | 1 (1.4%) | 1 | 1 |
| **Working unit** | Under five OPD | 25 (13.4%) | 28 (38.9%) | 5.51 (2.42-12.53)*** | 3.225 (.892-11.657) |
| | Pediatrics ward | 55 (29.4%) | 10 (13.9%) | .894 (.358-2.234) | .662 (.121-3.634) |
| | Neonatal ICU | 40 (21.4%) | 17 (23.6%) | 2.090 (.901-4.845)* | 3.798 (.947-15.233) |
| | Pediatrics ICU | 8 (4.3%) | 5 (6.9%) | 3.073 (.856-11.032)* | 2.013 (.207-19.579) |
| | Pediatrics emergency | 59 (31.6%) | 12 (16.7%) | 1 | 1 |
| **appoint children for developmental screening in their setup** | Yes | 112 (59.9%) | 49 (68.1%) | .701 (.394-1.246)* | .589 (.212-1.632) |
| | No | 75 (40.1%) | 23 (31.9%) | 1 | 1 |
| **Awareness on child developmental screening** | Yes | 108 (57.8%) | 58 (80.6%) | 3.03 (1.58-5.815)** | .825 (.268-2.540) |
| | No | 79 (42.2%) | 14 (19.4%) | 1 | 1 |
| **Knowledge on child developmental milestone** | Good | 68 (36.4%) | 38 (52.8%) | 1.566(.903-2.715)* | 1.256 (.507-3.110) |
| | Poor | 119 (63.6%) | 34 (47.2%) | 1 | 1 |

**Note:** *COR =crude odds ratio, AOR = adjusted odds ratio, CI = confidence interval at 95%, * = significant variables at P <0.05, ** = significant variables at P< 0.01, ***= significant variables at P< 0.001*

# 6. Discussion

In this study, though 93.1% (n=241) of health professionals assess the growth status of children, only 38.2% (n=99) have good practice of child growth assessment. This study also shows 44.8 %( n=116) of health professionals who have good knowledge of early child growth assessment. In addition 62.5% (n=162) of health professionals have positive attitude to child growth assessment. These findings indicate that though most health professionals have good attitude to early child hood growth assessment their practice were poor and attitude and knowledge has not significantly associated to practice in this study. This might be due to other factors in the personal and institution related factors that hinder to apply their knowledge and attitude to practice.

Hospital based descriptive cross-sectional studies done in South Africa on doctors' attitudes, knowledge and usage of growth charts find that only (41%) doctors achieved an acceptable total knowledge score on using growth charts. (67.8%) doctors reported a positive attitude to growth monitoring. Only 41.1% of doctors have adequate growth chart usage score. By assuming growth chart usage score as practice, we would say that there is no significant difference in the frequency of knowledge, attitude and practice findings of this study. In this study, 76% (n= 197) health professionals reported as they have workload greater than eight hours per day. In addition, only 35% (n= 91) got additional training on child growth assessment and majority of them 72.6% (n=188) were work experience less than five years. The above-mentioned study in South Africa shows (57%) of the doctors had high workloads. This difference might be due to difference in sample size and profession. In this study, the data were collected from mixed type health professionals who might have different workloads. [37]

In our study, 93.1% (n=241) health professionals assess the growth status of children in their practice centers. Most of the respondents 57.3% (n=138) undress the child to get accurate weight and only 5% (n=12) would clean the scale after weighing each child. In similar study conducted in Nigeria shows three hundred and thirty two (89.2%) of the respondents reported that growth monitoring was practiced in their centers. Most of the respondents (93.5%) would undress the child before weighing for accurate weight and would clean the scale after weighing

each child (95.2%). [32] The significant difference in percentage of this two-practice variable might occur as due to difference in sample size and method of practice assessment. In this study the practice was assessed by observational checklist, however the study conducted in Nigeria was a response from health professionals without observing the actual practice.

The finding of this study showed that majority of health professionals 92.5% (n=223 record the child growth measurement findings in the medical health record. Inversely, an observational study conducted in Brazil showed that nurses recorded the measurements more frequently in the child health record than in the medical records. This study found that weight and height/ length measurements were held more frequently with the percentage of 100% & 82.6%) respectively. Head circumference measurements done infrequently (38.2%) and chest circumference was measured rarely (1%). The study in Brazil also showed, weight (84.9%), height (84.0%) and cephalic perimeter (82.7%) measurements were held more frequently. The significant difference in frequency of cephalic parameter measurement practice might be resulted from difference in health care setting. The study in Brazil was conducted in primary health care units, a setting where basic child assessment strategies are more practiced. [31]
Even though, there were not similar studies for comparison with significant variables, in this study sex, profession, training and work experience have an association with health professionals early childhood growth assessment practice. This study shows, female health professionals were more than two times (AOR = 2.025, 95%CI: 1.012-4.037) more likely to practice child growth assessment than males at P= 0.046. This might be due to natural capability of female to take responsibility and give concentration to things done.

Of the professionals general practitioners were seven times more likely practice early child hood growth assessment than nurses at (AOR = 7.416,95%CI: 2.455-22.401) at P = 0.000. This could be due to general practitioners mostly assigned at OPD and the setting is more appropriate to assess the growth status of children. It also might be a difference in job description and curricular content.

In this study health professionals with work experience greater than 11 years were more than seven times practice of early child hood growth assessment than those who are less than one year work experience at P=0.005 [AOR =7.281, 95%CI: 1.997-53.171). In another study conducted in South Africa shows, fewer years of experience (Fisher exact, p=0.015) was the

major factors associated with higher usage scores of growth chart. [37] Though the findings are contradicted, it is obvious that health professional that has more year of experience have the probability to get additional trainings and practice skills. The possible reason for the contradiction between these studies might be difference in sample of study units. . In the other study mentioned, the study subjects are only doctors who are no more year of experience after graduation.

This study also shows health professionals who got additional training in child growth assessment were about four times more likely practice of early child hood growth assessment than those who did not get additional training at P = 0.001 [AOR =3.97, 95%CI: (1.585-6.445)]. This might be due to additional training increases the skill and confidence in practice.

In this study, knowledge and attitude of health professionals to child growth assessment were not significantly associated. This could be due to presence of other factors that hinder practice despite acceptable knowledge and attitude score. Even though this study could not explore the reason, the hospital environment might give service more for acute and devastating health conditions than to basic childcare services.

In this study from n=259 participants only 28.6% (n=73) assesses the child for developmental milestone status. Only 3.68% (n=10) of the health professionals uses standardized developmental screening tool as guide for reference. From the participants 18.5% (n= 48) classify the child for developmental delay and 18.1% (n= 47) uses clinical diagnosis classification system. Only 0.77% (n=2) uses IMCI context classification system for child developmental delay. Another study on attitudes, practices, and barriers of primary care practitioners in screening emotional-behavioral problems in children shows that traditional techniques and clinical observation are the most commonly used with over 90 percent respondents endorsing non-standardized interviewing, review of systems. Consistent, universal use of standardized assessment tools were endorsed by only (2.6%).[18] Therefore, our research finding is almost similar with the other research finding which show the use of standardized child developmental milestone assessment tool were remained low and health professionals more relay on clinical observation than systematized instruments. researches notes that, good developmental screening instruments, correctly identify more than 75% of children with problems.[34] despite this much significance, the practice of using this

important tool was low. Even the finding in our study show that there is no standardized child developmental assessment tool put as hard copy for office reference rather, only seven health professionals who practice the child developmental milestone assessment uses a reference tool from their mobile.

In this study, only 27.8% of health professionals report that as they perform child developmental screening at regular interval (9, 18, 24, 30, 36 months) old. American Academy Pediatrics 2007 (AAP) recommends surveillance at every visit for well and sick child visits and standardized screening at 9 months, 18 months, 24 and/or 30 months and Pre-kindergarten. The application of this basic childcare recommendation was low in our study. Research findings indicate though majority of the world countries accept the importance of using surveillance tools the practice for using the tools regularly is low. [22] This finding is consistent with our research finding.

Majority of health professional use medical referral form to refer a child with suspected developmental delay and 61(23.5%) health professionals gave counseling for the parents based on the assessment findings. 27.8% (n= 72) health professionals have good practice of early child hood developmental assessment with a mean value of 1.46, SD = +/- 2.4, [(Min, Max) (0, 8)]. Another study on Family Health Strategies in Joao Pessoa, found that 75.4% did not have the child developmental assessment accompaniment norms. [17] this finding is consistent with our research finding which shows lack of referral forms and lack of developmental milestone assessment tools. though studies show that anticipatory guidance based on the surveillance assessment data helps parents anticipate the next developmental stage and stimulate developmentally appropriate behaviors, this study shows low practice of counseling based on child developmental assessment findings. [35]

Majority of health professionals 88% got information on child developmental assessment in college education and only 22.8% (n=59) health professionals got additional training on child developmental assessment and 44.1% (n=26) them trained by university educators as project. Another studies showed, (88%) of health professionals lack training in use of appropriate screening tools as barrier for poor practice of child developmental screening. [18] [36] The finding of this study also showed training on this basic child care service is low (22.8%).

The finding of this study showed that 27.79% (n=72) of health professionals ask the family about their opinion on their child development and 23.5% (n=61) provided guidance to the family on how to stimulate child development. Only 3.86% (n=10) health professionals used standardized developmental assessment tool to evaluate the child development. Another intervention study with nurses conducted in Latin America on child development surveillance showed that 73% of nurses asked the opinion of mothers about their children's development and 91% nurses provide guidance to mothers on how to stimulate child development. Only 42% nurses used systematized instrument to evaluate child developmental status [22]. The gap in the frequency of these studies might be resulted from difference in professional characteristics and service provision setting in which the study in Latin America used only nurse professionals who worked in primary health care but this study used mixed professionals who worked at public hospitals.

Though there was no other, findings reported the degree of association of determinant variables, in this study, profession and year of experience significantly associate with health professionals practice in early child hood developmental milestone assessment. General practitioners were more than twenty three times more likely to practice early child hood developmental milestone assessment than nurses at (AOR = 23.826, 95%CI: 6.77- 83.9) at P = 0.000. In addition, health officer professionals were more than eleven times more likely to perform the practice than nurses at [AOR = 11.02, 95%CI: (2.1-58.812)] at P-value = 0.005. This wide gap in confidence interval may be resulted from strong association with the variable. Obviously general practitioners and health officers are mostly provide their service in OPD setting a place where relatively healthy children's seen and appropriate place to give basic child care service.

This study also shows, health professionals with work experience greater than 11 years were more than twenty times practice of early child hood developmental assessment than those who are less than one year work experience at P-value =0.024 [AOR =20.897, 95%CI: 1.5-291.49). This might be due to their experience gave them confidence and skill on providing health services. Sex, age, knowledge, awareness, training and availability of equipment's in child developmental milestone assessment were not significantly associated in the multi-variable logistic regression model.

# 7. Strength and limitation

## Strength:

Different experts from clinical and educational service were assessing the content validity of the questionnaire. Pretest was done in 5% of the sample population in two hospitals outside the study area, which could help to see the consistency and clarity of the questionnaire. The study analysis incorporates logistic regression analysis, which other related studies did not perform.

## Limitation:

This research was better if it was done in primary health care facilities where basic childcare service is given better. The facility based cross-sectional study only shows the practice at point in time might affect by different factors. Determinant variables were assessed by self-administered questionnaire that was exposed to social desirability bias and easy to remember the answer of knowledge assessing questions.

# 8. Conclusion and Recommendation

## 8.1. Conclusions

This study provided a baseline finding on the level of practice of early child hood growth and developmental milestone assessment in the study area. The findings of this research shows, the practice of early child growth and developmental milestone assessment was poor. In this study sex, profession, training and work experience have an association with health professionals early childhood growth assessment practice. Profession and year of experience are also the only two variables that significantly associate with health professionals practice in early child hood developmental milestone assessment. Training and re-training of all health professionals and experience sharing among professions & highest work experience could improve the practice level.

## 8.2. Recommendation

Based on the finding of this study, the following recommendations were forwarded to different stakeholders:

**For health institutions:**

- Training of health professionals on child growth assessment based on different recommended guideline should be strengthening to enhance their practice.
- It could be better if health professionals give emphasis to child growth and developmental milestone assessment practice. Because, this assessment service is the only indicator to determine and intervene any growth and developmental problems early in life, before significant morbidities occur.
- Health professionals with more experiences on the service should transform their practice skill to others.
- All health professionals recommended to consistently applying the practice by giving emphasis to the paramount importance for children wellbeing.

**To Addis Ababa health bureau and Ethiopian ministry of health**

- ✓ The ministry of health and regional health biros recommended organizing training services in both early child hood growth and developmental milestone assessment for health professionals to equip them with skill and awareness on the service.
- ✓ It is also recommended to supervise and make growth and developmental assessment tools available in health institutions to improve the practice.
- ✓ The ministry of health recommended on formulating a policy on early child hood developmental screening and surveillance practice to create awareness and emphasis in the service.

**For researchers:**

- Future studies should emphasize mixed methods, such as triangulating with a qualitative study design and prospective study designs to identify determinants for practice of early child hood growth and developmental milestone assessment practice.
- Availability of fertile ground to apply consistent early child hood growth and developmental screening and surveillance service and its challenges is another area of study recommended.

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# 10. ANNEXES

## 10.1. Consent form for data collection

How are you! I am_____ from_____

I am here to collect data on the study title of practice of health professionals on early child hood growth and developmental assessment and its determinants in paediatric care units in this hospital. This study will be conducted in six public hospitals in Addis Ababa. In this study, data will be collected from the health professionals who working in paediatric care units in the hospital. You are an important stakeholder in this study and therefore I would appreciate if you could allot some valuable time to give information on this interviewer administer questionnaires. The information you provide will be kept confidential. No-unauthorized person has access to the information. You have the right to declare to participate or not. This study is expected to provide input for appropriate change in policy and program for improving the service delivery quality through improving provider's skill and knowledge. Participants neither faced any harm nor gain benefit in the process and outcome of this study.

**Contact address**: If you have any doubt regarding to the study; please contact and speak to the Principal investigator:

**HAILESLASSIE TESFAY**

**Phone number: +251924401056**

Therefore, I declare my voluntary consent for participants in this study with my initials signature as indicated below.

Investigators Name_____ signature _____date__/__/2018

Data collector's Name_____ signature _____date__/__/2018

Having read the information stated above, would you like to participate in this study?

1. **Yes**
2. **No**

## 10.2. Questionnaires

## Part one: socio-demographic characteristics

| S.NO | QUESTIONS | ANSWERS | SKIP |
|---|---|---|---|
| 101 | Age in years | _____ | |
| 102 | Sex | 1. Male 2. Female | |
| 103 | Marital status | 1. Married/ Living together<br>2. Single<br>3. Divorced/ Separated<br>4.Widowed | |
| 106. | Profession | 1. General practitioner<br>2. Pediatrician<br>3. neonatologist<br>4. Nurse<br>5. health officer | |
| 107. | How many years of experience do you have in working with young children (under age of five) | 1. Less than 1 year<br>2. 1–5 years<br>3. 6–10 years<br>4. 11–15 years<br>5. Greater than 15 years | |
| 108 | Highest level of education you learned | 1. Diploma<br>2. Degree<br>3. Masters<br>4. specialist<br>5. Sub specialist | |

## Part 2: professional and service variables in child growth assessment

| S.NO | QUESTIONS | ANSWERS | SKIP |
|---|---|---|---|
| 201 | Where is your working unit | 1. Under five OPD<br>2. Paediatrics ward<br>3. Paediatrics emergency<br>4. Paediatrics ICU<br>5. Neonatal ICU | |
| 202 | When do you assess growth and development of children recently (multiple choice is possible) | 1. Always as routine<br>2. Less than one month<br>3. 1-6 month<br>4. > 6 month | |

| | | | |
|---|---|---|---|
| 203 | Where do you get information on child growth assessment (multiple answer is possible) | **1.** in college education<br>**2.** in service training<br>**3.** experience by working in pediatrics unit<br>**4.** Google/ Internet<br>**5.** Media(radio/TV) | |
| 204 | Have you got additional training in child growth assessment other than school education? | 1. Yes<br>2. No | **If no skip to Q.no 208** |
| 205 | If yes to Q204, what type of training? | 1. In-service<br>2. Pre-service<br>3. others | |
| 206 | Who provide you the training? | 1. Ethiopian ministry of health<br>2. NGO<br>4. University as community service<br>3. Others specify… | |
| 207. | Number of training taken | **1.** One<br>**2.** Two<br>**3.** Three<br>**5.** 4 and above | |
| 208. | Availability of equipment for growth assessment(circle all available) | 1.weigh machine/scale<br>2. height board<br>3. tape mater<br>4. MUAC measuring tape<br>5. separate growth chart for sex<br>6. head circumference measuring tape<br>7. Others specify…… | |
| 209 | Average time to assess growth for one child | 1.<15 minute<br>2. 15-30 minute<br>3. 30-45 minute<br>5. >45 minute | |
| 210 | Work load per day | **1.** <=8hrs<br>**2.** 8 - 16hrs<br>**3.** 16 – 24hrs<br>**4.** >=24hrs | |
| 211 | Does your hospital have growth monitoring guidelines | **1.** Yes<br>**2.** No | **If no skip to part- 4** |
| 212 | If Yes, to Q 211 do you use it for child growth monitoring? | **1.** Yes<br>**2.** No | |
| 213 | Did you get supervision and support on child growth assessment? | **1.** Yes<br>**2.** No | |
| 214 | If yes to Q213, from where you get the supervision? | **1.**NGO<br>**2.** Government<br>**3.** Other_____ | |

**Part 4: questions to assess knowledge of child growth assessment**

| S.NO | QUESTIONS | ANSWERS | SKIP |
|---|---|---|---|
| 401 | Why do we assess children's growth? (choose all that apply) | 1. Disturbance in health and nitration affects growth<br>2. Expectation of potential growth problem<br>3. To give anticipatory guidance for parents<br>4. to diagnose malnutrition<br>5. I do not know | |
| 402 | Which chart is recommended to monitor the growth of infants and children in Ethiopia? (choose all that apply) | 1. CDC growth chart<br>2. WHO growth chart<br>3. Harvard NCHS<br>4. Local growth charts<br>5. I do not know | |
| 403 | When do you discuss about change in child growth pattern? Choose all that apply) | 1. At every healthy child visit<br>2. At every sick child visit<br>3. When there is a concern only<br>4. I do not know | |
| 404 | How does the growth pattern differ in children? (choose all that apply) | 1. It is the same in all children<br>2. It may differ across sex<br>3. It may differ based on breast feed status<br>4. It may differ based on living status<br>5. I do not know | |
| 405 | What do you know about body mass index (BMI) | 1. It can screen overweight when >85 percentile alone<br>2. It may be affected by children level of physical activity<br>3. Important screening tool along with other growth assessment findings<br>4. I do not know | |
| 406 | What does it indicate the deviation of plotted line above the upper reference curve | 1. Weight gain is normal and good<br>2. Excess weight gain<br>3. I don't know | |
| 407 | What is the meaning of a plotted horizontal line after sickness of the child | 1. There is no problem<br>2. Failure to grow due to infection<br>3. I don't know | |
| 408 | What is the lower limit of normal for birth weight | 1. Birth weight 3.5kg<br>2. Birth weight 2.5kg<br>3. Birth weight 1.5kg | |
| 409 | When do we plan for Intervention; | 1. Plotted line is between the two reference curves.<br>2. Plotted line is outside the two reference curves.<br>3. I don't know | |

## Part 5: questions on professional's attitude of child growth assessment

**Click √ to the responses that BEST describe your most recent feeling of growth assessment on your clinical placement area based on the evaluation scale 1-5.**

| S.NO | QUESTIONS | fully disagreed(1) | disagree to some extent(2) | neither agree nor disagree(3) | agree to some extent(4) | fully agree(5) | SKIP |
|---|---|---|---|---|---|---|---|
| 501 | Do you think that growth assessment is necessary for children | | | | | | |
| 502 | Do you believe that the process of growth assessment consume time | | | | | | |
| 503 | Is the process of growth assessment bulky? | | | | | | |
| 504 | Do you think that all children need growth assessment | | | | | | |
| 505 | growth monitoring is the only indicator to identify protein energy malnutrition and obesity | | | | | | |

## Part 6: professional and institutional variables on child developmental assessment

| S.NO | QUESTIONS | ANSWERS | SKIP |
|---|---|---|---|
| 601 | Do you assess children for developmental disorder in your practice setup? | 1. Yes<br>2. No | **If no skip to Q.no 603** |
| 602 | If yes, when do you apply the process of developmental assessment? | 1. At all visits (well and sick)<br>2. At all well visits<br>3. At selected visits<br>4. Whenever a parental concern is expressed<br>5. Other *(please specify)*---------- | |
| 603 | Where do you get information about child developmental assessment **(circle all that apply)** | 1. in college education<br>2. in service training<br>3. experience in working unit<br>4. Google<br>5. Media<br>6. Others | |
| 604 | Did you get training on child development assessment in your in practice? | 1. Yes<br>2. No | **If no skip to Q.no 607** |
| 605 | If yes who provide you the training? | 1. Ethiopian ministry of health<br>2. NGO<br>3. University educators as project<br>4. Others specify…… | |
| 606 | Number of training | 1. One | |

| | | | |
|---|---|---|---|
| | | 2. Two<br>3. Three<br>4. >=four | |
| 607 | Do you appoint children's for developmental screening in your practice? | 1.Yes<br>2. No | **If no skip to Q.no 609** |
| 608 | If yes, at what age of the child do you apply the screening? | 1. At regular interval( 9,18, 24,30,36 month )<br>2. At every well-child visit<br>3. At every sick child visit<br>4. When previous developmental assessment demonstrates risk<br>5. Whenever a parental concern is expressed<br>6. Other *(please specify)* _____ | |
| 609 | Do you have standardized developmental assessment tool in your set up? | 1. Yes<br>2. no | **If no skip to Q.no 611** |
| 610 | If "yes", which developmental assessment tool do you use?<br>(choose all that apply) | 1. Ages & Stages Questionnaires(ASQ) and (M-CHAT)<br>2. Battelle Developmental Inventory Screening Test (BDIST)<br>3. Bayley Infant Neurodevelopmental Screener (BINS)<br>4. Denver Developmental Screening Test II (DDST-II)<br>5. Early Childhood Inventory-4 (ECI-4)<br>6. Infant-Toddler Developmental Assessment<br>7. Others specify…… | |
| 611 | If no to Q 609, How do you assess the development of a child? | 1. Using only the knowledge<br>2. Using systematized instrument<br>3. Do not evaluate the development | |

**Part 7: Awareness of health professionals on child developmental screening and surveillance**

| S.NO | QUESTIONS | ANSWERS | SKIP |
|---|---|---|---|
| 701 | Have you heard about child developmental screening and surveillance service? | 1. Yes<br>2. No | **If no skip to Q.no 703** |
| 702 | If yes, what type of service is it? | 1. A regular age appropriate developmental status assessment by health professionals<br>2. A health care service for children with mental illness<br>3. I do not know | |
| 703 | Have you heard or seen child developmental screening and surveillance service in our country? | 1. Yes<br>2. No | |

**Part 8: questions to assess knowledge of health professionals on child developmental assessment**

| | | | |
|---|---|---|---|
| 801 | **Developmental Domain or Milestone**<br>***Physical Development*** | | |
| 8011 | The age at which child reach for Objects | 1. 4-6 months<br>2. 6-12 months<br>3. 12-18 months<br>4. 24-36 months | |
| 8012 | The age at which child crawl | 1. 4-6 months<br>2. 6-12 months<br>3. 12-18 months<br>4. 24-36 months | |
| 8013 | The age at which child walk | 1. 4-6 months<br>2. 6-12 months<br>3. 12-18 months<br>4. 24-36 months | |
| 8014 | The age at which child dress themselves | 1. 4-6 months<br>2. 6-12 months<br>3. 12-18 months<br>4. 24-36 month | |

| | | | |
|---|---|---|---|
| 802 | ***Cognitive Development*** | | |
| 8021 | The age at which child engage in Pretend Play | 1. 6-12 months<br>2. 12-18 months<br>3. 18-24 months<br>4. 24-36 month | |
| 8022 | The age at which child follow Simple Instructions | 1. 6-12 months<br>2. 12-18 months<br>3. 18-24 months<br>4. 24-36 month | |
| 8023 | The age at which child begin Counting | 1. 6-12 months<br>2. 12-18 months<br>3. 18-24 months<br>4. 24-36 month | |
| 803 | ***Social Development*** | | |
| 8031 | The age at which child begin parallel play | 1. 18-24 months<br>2. 24-36 months<br>3. 36-60 months<br>4. >72 months | |
| 8032 | The age at which child share Toys | 1. 24-36 months<br>2. 36-60 months<br>3. 60-72 months<br>4. >72 months | |
| 8033 | The age at which child play alone for 1 hour | 1. 24-36 months<br>2. 36-60 months<br>3. 60-72 months<br>4. >72 months | |
| 8034 | The age at which child need to have best friends | 1. 24-36 months<br>2. 36-60 months<br>3. 60-72 months<br>4. >72 months | |
| 8035 | The age at which child show empathy | 1. 24-36 months<br>2. 36-60 months<br>3. 60-72 months<br>4. >72 months | |
| 804 | ***D. Emotional Development*** | | |
| 8041 | The age at which child manifest differential cries | 1. 4-6 months<br>2. 6-12 months<br>3. 12-18 months<br>4. 60-72 months | |
| 8042 | The age at which child create bond with caregiver | 1. 4-6 months<br>2. 6-12 months<br>3. 12-18 months<br>4. 60-72 months | |

| | | | |
|---|---|---|---|
| 8043 | The age at which child recognize Others' emotions | 1. 4-6 months<br>2. 6-12 months<br>3. 12-18 months<br>4. 60-72 months | |
| 8044 | The age at which child exert independence | 1. 4-6 months<br>2. 6-12 months<br>3. 12-18 months<br>4. 60-72 months | |
| 8045 | The age at which child advocate for fairness | 1. 4-6 months<br>2. 6-12 months<br>3. 12-18 months<br>4. 60-72 months | |
| 805 | **E. <u>Language development</u>** | | |
| 8051 | The age at which child starts first smile | 1. before 3 months<br>2. 3 months<br>3. 4 months<br>4. 5 months | |
| 8052 | The age at which child start saying first words | 1. before 6 months<br>2. From 6 to 12 m<br>3. 12 to 24 m<br>4. More than 24 months | |
| 8053 | The age at which child start babbling sounds | 1. 3 months<br>2. 4 months<br>3. 5 months<br>4. 6 months | |
| 8054 | What is the child expressive language at 18 months | 1. forms sentences of two words<br>2. speaks about 30 single words<br>3. speaks about 200 single words<br>4. speaks the first words such as: Mom, Dad | |

## Observational checklist for data collection to be filled by data collector

**<u>Part 3: observational checklist on practice of child growth assessment</u>**

| S.NO | QUESTIONS | YES (√) | NO (√) | ALTERNATIVE CHOICES ® | SKIP |
|---|---|---|---|---|---|
| 301 | Health professional assesses the growth of Child | | | | **If no skip to part 4** |
| 302 | Child growth assessment technique used (**Choose all that apply)** | | | 1. History from parent and child<br>2. Head to toe physical examination<br>3. Focused physical examination<br>4. Growth measurement tools<br>5. Others…… | |

| | | | | | |
|---|---|---|---|---|---|
| 303 | Procedures performed (choose all that apply) | | | 1. The scale is cleaned after each child is weighed<br>2. The child is undressed to get accurate weight<br>3. shoes, socks, and hair ornaments removed<br>4. the length board is covered with a thin cloth or soft paper<br>5. imaginary vertical line from the ear canal to the lower border of the eye socket is perpendicular to the board on height /length measurement<br>6. gentle pressure is applied on the knee | |
| 304 | growth measurement done **(Choose all that apply)** | | | 1. Weight<br>2. Length/height<br>3. Head circumference<br>4. MUAC<br>5. Chest circumference<br>6. Others…….. | |
| 305 | The purpose of the assessment is explained to the parent | | | | |
| 306 | child growth assessment findings documented | | | | |
| 307 | Documentation chart used (Multiple choice is possible) | | | 1. Infant /child primary health record<br>2. Medical health record<br>3. Percentile chart for weight and height<br>4. Sex specific child growth recording sheet<br>5. Others specify…… | |
| 308 | Growth measurement findings interpreted | | | | **If no skip to Q.no 309** |
| 309 | Interpretation result used | | | 1. Weight-for-age chart<br>2. Height-for-age chart<br>3. Weight-for-height/length chart<br>4. Head circumference chart<br>5. Body mass index for age<br>6. Others specify … | |
| 310 | counseling on the growth assessment findings is given to the parents | | | | **If no skip to part 9** |
| 311 | Type of counseling | | | 1. Feeding and nutrition | |

| | | | | | |
|---|---|---|---|---|---|
| | given | | | 2. Growth status of her child<br>3. When to return<br>4. Referral<br>5. Others specify… | |

**Part 9: Observational checklist on practice of health professionals on child development assessment**

| S.NO | QUESTIONS | YES (√) | NO (√) | ALTERNATIVE CHOICES ® | SKIP |
|---|---|---|---|---|---|
| 901 | Child developmental assessment is done | | | | |
| 902 | Parents asked their opinion on his/her child development | | | | |
| 903 | child developmental risk factors assessed | | | | **If no skip to Q.no 905** |
| 904 | Risk factors assessed **Choose all that apply** | | | 1. gyni-obstetric risks<br>2. Social environmental risk factors (maternal depression, violence, drugs, alcoholism…)<br>3. family history of mental illness<br>4. feeding and nutritional pattern<br>5. Others specify…… | |
| 905 | Health professionals look for phonotypical developmental alteration | | | | |
| 906 | Child development assessed by standardized screening tool | | | | **If no skip to Q.no 909** |
| 907 | Assessment tool used (**Choose all that apply)** | | | 1. Ages & Stages Questionnaires(ASQ)<br>2. Battelle Developmental Inventory Screening Test (BDIST)<br>3. Bailey Infant Neurodevelopmental Screener (BINS)<br>4. Denver Developmental Screening Test II (DDST-II)<br>5. Personal guide on age appropriate milestone<br>6. Others specify…… | |

| | | | | | |
|---|---|---|---|---|---|
| 908 | Source of the assessment tool | | | 1. Hard copy for office reference<br>2. His own mobile<br>3. Search from the intern ate at that time<br>4. Books in electronic device<br>5. Other | |
| 909 | Technique used to assess child development | | | 1. History from parent and child<br>2. Physical examination<br>3. personal screening guide<br>4. age appropriate milestone reference | |
| 910 | Child classified for developmental delay | | | | **If no skip to Q. no 912** |
| 911 | classification system done | . | | 1. The IMCI contexts developmental classification<br>2. Clinical diagnosis<br>3. Others specify……. | |
| 912 | child with suspected developmental delay referred | | | | **If no skip to Q.no 914** |
| 913 | Source of reference to refer suspected developmental delay | | | 1. The IMCI guide classification<br>2. Developmental delay referral algorithm in office<br>3. Medical referral form<br>4. Others specify | |
| 914 | Parents get counseling based on assessment findings | | | | **If no, end.** |
| 915 | Type of counseling given | | | 1. How to stimulate her child's growth<br>2. Red flags to developmental delay<br>3. Schedule of return visit<br>4. Advantage of referral<br>5. Others specify…… | |

## 10.3. Descriptive statistics of figures in the result of the study

| Variables | Categories | frequency | Percent (%) |
|---|---|---|---|
| practice of child growth assessment | poor practice | 160 | 61.8% |
| | good practice | 99 | 38.2% |
| knowledge of child growth assessment | below average | 143 | 55.2% |
| | average and above | 116 | 44.8% |
| attitude of child growth assessment | negative attitude | 97 | 37.5% |
| | positive attitude | 162 | 62.5% |
| Source of information on child developmental milestone assessment | in college education | 228 | 88.0% |
| | in service training | 55 | 21.2% |
| | experience in working unit | 131 | 50.6% |
| | Google | 101 | 39.0% |
| | Media | 23 | 8.9% |
| Child developmental milestone assessment tool | Ages & Stages Questionnaires(ASQ) and (M-CHAT) | 54 | 56.3% |
| | Battelle Developmental Inventory Screening Test (BDIST) | 20 | 20.8% |
| | Bayley Infant Neurodevelopmental Screener (BINS) | 9 | 9.4% |
| | Denver Developmental Screening Test II (DDST-II) | 6 | 6.3% |
| | Early Childhood Inventory-4 (ECI-4) | 11 | 11.5% |
| | Infant-Toddler Developmental Assessment | 27 | 28.1% |
| | other screening tool | 3 | 3.1% |
| Type of risk factors assessed | gyni-obstetric risks | 45 | 75.0% |
| | Socio- environmental risk factors (maternal depression, violence, drugs, alcoholism | 24 | 40.0% |
| | family history of mental illness | 42 | 70.0% |
| | feeding and nutritional pattern | 53 | 88.3% |
| | other developmental risks | 2 | 3.3% |

## 10.4. Training module for data collectors and supervisors

**I. Instruction**

- ☞ Identify target subjects to be interviewed
- ☞ Procedures to be followed during interview of subjects, care of use of non-leading questions
- ☞ When to interview/convenient time
- ☞ When to start data collection and when to end

**II. Methods of training**

- ✓ Pass through the instrument or data collection tool with data collectors to point out specific instructions
- ✓ Provide an example of a completed instrument or an interview transcript for the data collectors
- ✓ Allow data collectors to practice with the tool

**Table: training module manual**

| Data collection method<br>Or instruction | Data collector | Training needs | Training activities |
|---|---|---|---|
| Health professionals in selected public hospitals in Addis Ababa | BSc Nurses | observation and distribution techniques<br>How to follow and feel the instrument | Observation instruction<br>How to ask questions<br>Trainee observation practice |

**10.5 Investigators Curriculum vitae**

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## Brief profile

[My name is ***Haileslassie Tesfay Tadese***. I was born in 1989 G.C in Eastern Tigray, Atsbi Wenberta Wereda, and Adimesanu Kebele. I had followed my primary and secondary school education in Atsbi primary and secondary school respectively. I was completed my lower school successfully with excellent academic achievement and motive participation in surrounding activities i.e. club and community participation. I have joined the university since 2003 E.C or 2010 G.C. at Debre Birhan university with the discipline of nursing. After entrance to the university, I had fully engaged in social, community and academic related activities, trainings, and I were certified for each participation. I have completed the fourth year nursing curriculum competently with very great distinction academic achievement score of ***3.84***. Then, I have graduated with BSc degree in nursing since June 2006 E.C or 2014 G.C.]

## Professional experience

After graduation, I had worked for four consecutive months at Gerbiber health center, then after I have working in Debre Birhan University for a year and half. I have trained and certified in effective teaching and higher diploma program in pedagogy. I have also participated in workshops, seminars and community clubs. Finally, with sponsor ship from DBU, I am year II master's graduating class in Addis Ababa University right now.