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Assessment of Oral Health Status of Children with Chronic Disease and their Parents/Caregivers' Knowledge, Attitude and Practice towards Oral Health at Jimma University Medical Center, South West Ethiopia, 2020

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Jimma University
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ABSTRACT

Background: Oral health problems are among the most common health problems in the world affecting 60-90% of children in the world. Poor oral health, particularly in children with chronic diseases is a major cause of morbidity and it can be a risk factor for severe complications of their chronic diseases.

Objective: The aims of the study are to assess the oral health status of children with chronic diseases and the knowledge, attitude and practice of their parents/care takers towards oral health at Jimma Medical Center (JMC).

Methods: Hospital based cross sectional study was conducted on 422 parents/caregivers and 422 children with chronic illnesses at JMC pediatric follow up clinic. A consecutive sampling technique was used to select the study participants. Pretested questioner was used to assess the socio demographic factors, knowledge, attitude and practice of parents towards oral health and “World Health Organization’s (WHO) oral health assessment tool” was used to assess the oral health status of the children. Data were entered to EPI data version 3.1 and exported to Statistical Packages for Social Sciences (SPSS) version 23 for statistical analysis. Descriptive statistics was used and findings were reported using texts and tables. Multiple logistic regression analysis was used to identify independent predictors of oral health status. A p-value of <0.05 was used to declare statistically significant associations at a 95% confidence interval (CI).

Results: A total of 422 parents/care givers and 422 children with chronic diseases were included into the study. More than half (222, 52.6%) of the parents/caregivers have good knowledge. Majority (321, 76.1%) of the parents/caregivers had good attitude towards oral health but only less than a third (126, 29.9%) of them had good practice. Out of the 422 children enrolled into the study, 145 (34.3%) had dental caries. Children from parents/care takers with poor knowledge towards oral health are 2.5 times more likely to have oral health problems than children from parents with good knowledge [AOR=2.6, 95%CI=1.49-4.39]. Children with diabetes are also twice more likely to have oral health problems as compared to children with epilepsy [AOR=1.96, 95%CI=1.04-3.68].

Conclusion: Dental caries is a common problem among children with chronic diseases at JMC. While the attitude of parents/caregivers of children with chronic diseases regarding oral health is good, their knowledge and practice is poor.

Recommendation: Coordinated efforts between the departments of pediatrics and child health and dentistry is required to improve the knowledge and practices of the parents and care takers and the oral health status of the children with chronic diseases.

Keywords: Oral health, chronic disease, knowledge, attitude, practice, Jimma, Ethiopia

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ACRONYMS AND ABBREVIATION

AAPD	American academy of pediatrics dentistry
AED	Antiepileptic drug
CHD	Congenital heart disease
DM	Diabetes mellitus
JMC	Jimma Medical Center
HIV	Human immune deficiency virus
RHD	Rheumatic heart disease
WHO	World Health Organization

CHAPTER: 1 INTRODUCTION

1.1 Background

Dental development starts at five weeks of gestation in utero and it has five stages of development: epithelial thickening, lamina, bud, cap and bell stage. The primary teeth arise from the interaction of epithelial cell which is derived from the embryonic ectoderm and a connective tissue derived from neural crest. The human teeth have four tooth classes, which are incisor, canines, premolar and molar (1, 2).

There are two generations of dentition in human life, primary teeth and permanent teeth. There are twenty primary (also called deciduous, baby) teeth which start to erupt starting from the age of six to ten month and completed by age of three years. The eruption is symmetrical with right and left teeth appearing at similar time. Central incisors are the first to erupt followed by lateral incisors, first molar canine then second molar in sequential order. The permanent tooth starts to erupt by the age of six years and completed at the age of 13 years (3).

The World Health Organization (WHO) defines oral health as “a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual’s capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing”(4).

Oral health includes healthy gums, hard and soft palate, linings of the mouth and throat, tongue, lips, salivary glands, chewing muscles, and upper and lower jaws. Good oral health has a positive impact on a person’s appearance, comfort, well-being, self-esteem, self-confidence, social acceptability as well as good general health. Thus, good oral health is essential for maintaining optima wellbeing (5, 6).

Oral health and general health are interrelated; different chronic or infectious diseases having symptoms in the oral cavity which compromises oral health. On the other hand, oral disease can affect the overall health by causing systemic infection, inflammation or other systemic problems(4).

Dental caries is the most common chronic oral health problem and the most common chronic childhood disease, being 5 times more common than asthma. It is caused by dental plaque deposits on the tooth surface which is produced by bacteria in the oral cavity. The bacteria ferments the sugar in the diet and produce acid that dissolves tooth enamel causing dental caries(7).

According to WHO, between 60 and 90% of children in the world are affected with dental caries but the majority of them remain untreated due to inappropriate, unaffordable or unavailable oral health care services(8).

American academy of pediatrics dentistry (AAPD) suggests the following advice for parents to prevent dental caries and maintain the child's oral hygiene practice: first dental visit of child within six months of eruption of first primary tooth; brushing teeth twice daily; cleaning the gums of even a very small infant with a soft washcloth; establishing a daily oral hygiene routine; using soft toothbrush with a small head and a large handle for infants and toddlers; supervising tooth brushing for those less than 6 years; brushing all accessible surfaces of each tooth and avoiding swallowing of fluoridated toothpaste by the child (9).

Most chronic diseases in children are associated with poor oral hygiene. These children have multiple risk factors for poor oral health, including social disadvantage, long term exposure to sugar containing medications, and the fact that their dietary habits may not be optimal(10, 11).

Among children with chronic diseases, children with cardiac diseases including rheumatic heart disease (RHD) and congenital heart disease (CHD) need special attention in terms of oral health, since a poor oral hygiene/oral health predisposes them for infective endocarditic, which is infection of the internal layers of the heart chambers, associated with grave complications as well as increased morbidity and mortality in these group of children(12).

Children with epilepsy receive different types of antiepileptic drugs (AEDs), some of which like phenytoin, when used for longer term result in gingival overgrowth which is cosmetically disfiguring and increases the area for plaque formation. It may even progress in severity to affect speech and mastication. Despite the fact that patients with epilepsy tend to have poorer oral

health and dental status, they receive less adequate dental treatment in comparison with the general (non-epileptic) population (13-15).

Diabetes mellitus (DM) is associated with several types of disease of the oral cavity including dental caries and tooth loss, periodontal disease, change in salivary flow and saliva composition (16, 17). Some of these diseases of the oral cavity like periodontal diseases are associated with poor metabolic control and other complications of DM, underlining the importance of good oral health in patients with DM in order to improve the treatment outcomes and survival of children with DM (18, 19).

Different studies have also shown that Human Immunodeficiency Virus (HIV) infection has a negative impact on an individual's oral health (20, 21). Around 40-50% of HIV patients are affected with bacterial, viral or fungal oral infection. Oral lesions strongly associated with HIV infection are pseudo-membranous oral candidiasis, oral hairy leukoplakia, HIV gingivitis and periodontitis, Kaposi sarcoma and non-Hodgkin lymphoma (20, 22).

During childhood, parents especially mothers, play the most important role in oral hygiene and dental health of children. Hence, appropriate parental knowledge, attitude and practice (KAP) regarding oral health is crucial to optimize the oral health status of their children. Thus, determining and improving the KAP of parents about oral health is an essential precondition for better oral health of their children with chronic illnesses (6). Additionally, health care workers taking care of children with different chronic diseases should regularly assess the oral health status of these children, provide necessary counseling for the children and/or their parents/care takers and also facilitate the necessary treatments for those children with any of the oral health problems. Hence, this study was done with the aims of assessing the oral health status of children with chronic diseases and the knowledge, attitude and practice of their parents/care takers towards oral health at Jimma Medical Center (JMC).

1.2 Statement of the problem

Oral health problem is a major public health problem in developed countries and the burden is increasing in developing countries. Since oral diseases and chronic diseases have several things in common, on 2003 World Oral Health report, WHO global oral health program decided to

integrate oral disease prevention and oral health promotion with chronic disease prevention and general health promotion(23, 24).

Oral health is part of general health and wellbeing that contribute to the development of a child. Poor oral health has several impacts on the children themselves as well as their family and the society (25). Many chronic diseases in childhood have been associated with poor oral health and increased dental caries prevalence compared to controls. The prevention of dental disease in children who are medically compromised must be recognized as having a “dental special need” (10, 11). Despite this, oral health of children with chronic diseases didn't get much attention and many children with chronic diseases suffer from different forms of oral health problems.

1.3 Significance of the study

During childhood, parents especially mothers, play an important role in oral health and oral hygiene of children. So, this study will give us an insight about the knowledge, attitude and practice of the parents of children with chronic disease in our clinic. Additionally, determining the oral health status of the children with chronic illnesses will be very important to design an appropriate intervention which can tackle the associated problems.

CHAPTER 2

2.1 Literature review

Dental caries and periodontal diseases are considered the most important global oral health problems. Dental caries affects 60-90% of school age children and majority of adults globally. Since the past twenty years, the prevalence of caries is increasing due to increased consumption of sugar and inadequate exposure to fluoride. In contrast, as a result of different public health measures, fluoride use and improved life style and living condition, the prevalence of dental caries has decreased in developed countries (26).

In developing countries like Africa, Asia and Latin America which have shortage of appropriate health personnel, the oral health service is mostly found in urban areas only. Even in these areas, the health system is limited to giving only emergency care and pain relief with little emphasis given to restorative and preventive services (27).

Improving knowledge about oral health is essential precondition for improving oral health in a community (6). Multiple studies are done to assess knowledge of parents towards oral health. According to a case control study done in Iran on 25 parents of children with cardiac disease, the knowledge about oral health was poor in both groups; only 36% of children with cardiac diseases and 24% of the control groups had good knowledge (28).

Another cross sectional study done in India on 600 children in private schools aged between 6-12 years showed that, mothers' oral health related knowledge, attitude and practice has significant impact on their children's oral health status. On this study, the prevalence of caries was found to be high in children whose mothers are educated only up to primary level. It also showed that 60% of mothers knew that some tooth paste contain fluoride and 56.3% agreed on the importance of using fluoride containing toothpaste (29).

AAP recommended that tooth brushing and dental checkups should be started at the time of the eruption of the first primary tooth. However, on a cross sectional study done in Iran on 453 kindergarten students to evaluate the factors affecting preschool children's oral hygiene, only 20 % of children had dental checkups and only 29% of them started tooth brushing at the age of two years(30).

Fluoride is an important mineral which has a role in preventing and controlling dental caries. Drinking fluoridated water and brushing with fluoride toothpaste twice per day is the best way to prevent dental caries(31). However, according to a cross sectional study done in Black Lion Hospital on 385 parents of children with cardiac disease, only 70(18.2%) of parents/caretakers knew that tooth decay can be prevented by flourides while 44 (11.5%) did not know that fluorides can prevent dental decay(32).

A case control study at the university of Budapest, Hungary done on 101 patients with epilepsy to assess their dental status and oral health showed that, in almost all aspects of oral health and dental status (i.e., the state of remaining teeth and periodontium, extent of restorative and prosthetic treatment), patients with epilepsy showed significantly worse condition compared with an age-matched group of general population (i.e. those with no epilepsy)(14).

Despite the fact that oral diseases are affecting majority of the Ethiopian children, much is not known about the extents and factors influencing the occurrence of dental caries, oral care practices and health care seeking behavior in most parts of the country particularly in the study area; only handful of studies being reported in the literature.

A study conducted in Northwest part of Ethiopia reported 36.5% prevalence of dental caries among urban children in school (33). On a cross-sectional study done on young adolescents in Addis Ababa, the prevalence of dental caries was 47.4% (34). On school based cross-sectional study done in Bahir Dar on 147 primary school children age 6-15 years, 21.8% had tooth decay. It also showed that children from educated parents (above grade 12), are 100 times at lower risk of having dental caries than those from non-educated parents (35).

2.3 conceptual frame work

In conceptualization of this study, the concept is that, different factors like socioeconomic, health system related and other factors can affect the KAP of parents towards oral health. This, on the other hand, has a significant impact on the oral health status of their children. Other factors like, the type of chronic disease the child has, the drugs he/she is taking and neurologic condition of the child can have an effect on the oral health of the child.

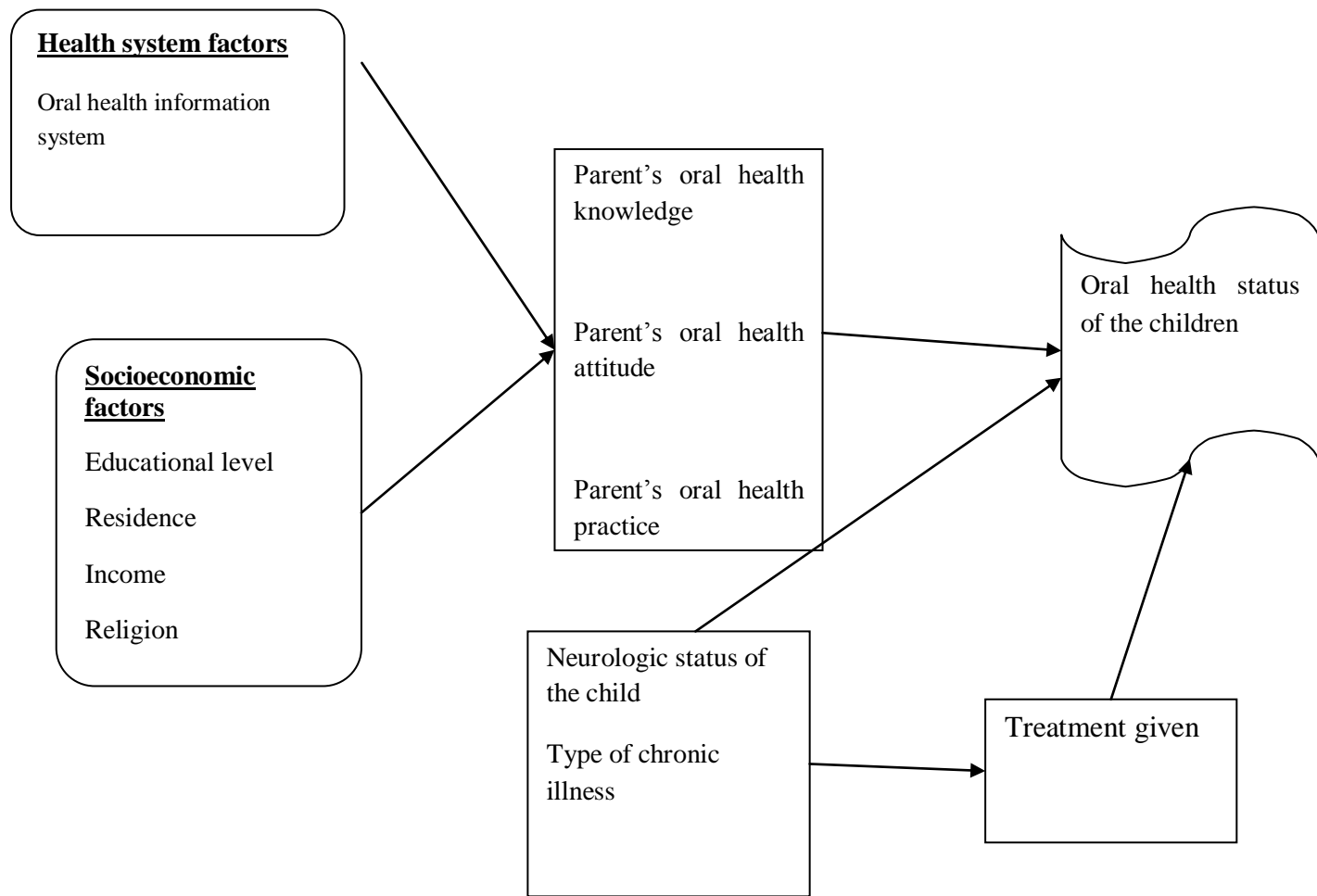


Figure 1: Conceptual frame work of the study

CHAPTER 3 OBJECTIVES

GENERAL OBJECTIVES

- To assess the oral health status of children with chronic diseases and the knowledge, attitude and practice of the parents/care givers of children with chronic disease regarding oral at JMC.

SPECIFIC OBJECTIVES

- To assess the oral health status of children with chronic diseases
- To evaluate the knowledge of parents/care takers of children with chronic diseases about oral health
- To assess the attitude of parents/care takers of children with chronic diseases towards oral health
- To assess the practice of parents/care takers of children with chronic diseases about oral health
- To determine the association between parents/care takers oral health knowledge, attitude, and practices and oral health status of their children.

CHAPTER 4 METHODOLOGIES

4.1 Study area

The study was conducted in Jimma Medical Center (JMC) at the pediatric follow up clinic, where children with different types of chronic diseases (DM, epilepsy, cardiac diseases, HIV, etc) are seen. The center is one of the oldest public hospitals in the country located in Jimma Town of Oromia Regional State, Ethiopia. The town is located 350 km far away from Addis Ababa and JMC is the referral center for over 15 million people in the south western part of Ethiopia. Besides providing clinical services for patients, the center hosts several undergraduate and post graduate programs in the field of basic sciences as well as clinical medicine including several dental and oral health services and trainings.

4.2 Study period

The study was conducted from April 15 to August 15, 2020.

4.3 Study design

Institution based cross-sectional study design was used.

4.4 Population

4.4.1 Source population

All children with chronic disease on follow up and their parents/caretakers attending pediatric follow up clinic at JMC.

4.4.2 Study population

Children between 3 and 18 years of age with one or more of DM, cardiac diseases, epilepsy or HIV having follow up at JMC chronic illnesses follow up clinic for at least six months and their respective parents/care takers.

4.5 Inclusion and exclusion criteria

4.5.1 Inclusion criteria

Children with one or more of DM, Epilepsy, HIV or cardiac disease between the age of 3 and 18 years and their parents/care takers were included.

4.5.2 Exclusion criteria

Those parents who are not willing to participate in the study

Children with chronic disease on follow up for less than six month

Mothers/care takers coming without bringing their children to the clinic

Children with critical illness making oral examination difficult

Children with severe physical disability making opening the mouth difficult

4.6 Sampling

4.6.1 Sample size determination

The sample size for the children as well as the parents/caregivers was calculated by using single population proportion formula. There is no similar published study, so we used prevalence of 50%.

$$n = \frac{(Z_{1-\alpha/2})^2 p(1-p)}{d^2}$$

With the following assumptions:

- n = minimum sample size,
- $Z_{1-\alpha/2}$ = significance level at $\alpha = 0.05$
- d = margin of error (5%)
- P = prevalence of 50%

- 10% non-response rate
- This resulted in a sample size of 422.

4.6.2 Sampling method

Consecutive sampling method was used until the required sample size was obtained.

4.7 STUDY VARIABLES

4.7.1 Dependent variable

- Oral health status of the child

4.7.2 Independent variables

- Parents'/care takers' knowledge, attitude and practice about oral health
- Socioeconomic and demographic factors (educational level, income, residency, religion, etc)
- Type of chronic disease

4.8 Data collection tool and technique

Structured close ended pretested questioner was used to assess the parent's knowledge, attitude and practice towards oral health. The questioner used for the parents/care takers had four parts: socio-demographic, knowledge, attitude and practice assessment parts. The tools were translated into local languages (Amharic and Afaan Oromoo). Additionally, the WHO structured oral health assessment tool (36) was used to assess the oral health status as well as clinical and demographic characteristics of the children.

Data were collected by two BSc nurses from another department and two dentistry final year students (interns) under the supervision of the principal investigator.

4.9 Data quality control

To ensure the data quality, two days training was given for the data collectors. The data collection was supervised by the principal investigator. Pretest was conducted on 5% (21) parents/care givers in JMC prior to 1 month of data collection to assess its clarity, length,

completeness and consistency. Every day, the collected questionnaires were reviewed and checked for completeness by the principal investigator and the necessary feedback was offered to data collectors.

4.10 Data Processing and Analysis

The data were checked for completeness, coded, edited, sorted, cleaned and entered into Epidata version 3.1, and then exported to SPSS (Version 23.0) for statistical analysis. Descriptive statistics (mean \pm SD, frequencies, proportions and tables) and logistic regression analysis was used to check independent effect of predictors on outcome variable. Variables with p-value $<$ 0.25 were subjected for multivariate binary logistic regression analysis to identify factors that affect the oral health status of the children. Significance was declared when p-value was $<$ 0.05 at 95% CI. To evaluate the strength of association between dependent and independent variables, adjusted odds ratio (AOR) with 95% confidence interval was used.

4.11 Ethical consideration

Ethical clearance was obtained from Institutional Review Board (IRB) of Jimma University Institute of Health. Written informed consent was obtained from parents/caregivers after clearly informing them the purpose and procedure of the study. Confidentiality of information collected from each study participant was maintained at all levels. Children with oral health problem/s were linked to the dental clinic for possible counseling and/or treatment of their condition/s.

4.12 Utilization and dissemination of results

The result of the study was presented to the department of pediatrics and child health, Jimma University. The final result from the study will be submitted to the Research and Postgraduate Office of JU in a form of written report. Additionally, we will try to publish the results of the study on peer reviewed journal.

4.13 Operational definition

Chronic disease: Patients with one or more of DM, HIV, Epilepsy or Cardiac disease who have regular follow up at JMC, at least for the past six months.

Oral health: Being free from diseases and disorders that affect the oral, dental, and cranio-facial tissues.

Good attitude: those who score \geq the mean

Poor attitude: those who score $<$ the mean

Good knowledge: those who score \geq the mean

Poor knowledge: those who score $<$ the mean

Good practice: those who score \geq the mean

Poor practice: those who score $<$ the mean

5. Result

5.1 Socio-demographic characteristics of parents of children with chronic illness at JUMC, 2020

A total of 422 parents/care takers were involved in the study with response rate of 100%. Among the parents/caregivers included in the study, over half were fathers (234, 55.5%) and from rural area (227, 53.8%). The mean age of the parents/care givers is 39±9. Three fourth (313, 74.2%) of the participants were Muslim. (Table 1)

Table 1: Socio-demographic characteristics of parents/ care givers of children with chronic diseases, JMC, 2020

S. No	Variables	Category	Frequency	Percentage (%)
1.	Age (Mean ± SD 39±9)	≤30	83	19.7
		31-40	172	40.8
		≥40	167	39.2
2.	Sex	Male	269	63.7
		Female	153	36.3
3.	Relationship to the child	Father	234	55.5
		Mother	132	31.3
		Grand father	5	1.2
		Grandmother	7	1.7
		Other	44	10.4
4.	Monthly income	≤ 1000 birr	70	16.7
		1001-2000 birr	123	29.1
		2001-3000 birr	118	28
		3001-4000 birr	63	14.8
		≥4001 birr	48	11.4

5.	Educational level	Illiterate	131	31.0
		1-4	92	21.8
		4-8	79	18.7
		8-12	43	10.2
		TVET	28	6.6
		College/university	49	11.6
6.	Residency	Urban	195	46.2
		Rural	227	53.8
7.	Religion	Muslim	313	74.2
		Orthodox	81	19.2
		Protestant	27	6.4
		Others	1	0.2

5.2 Knowledge of parents/care takers of children with chronic illness about oral health

Almost all parents/care takers (419, 99.3%) knew that a child's teeth need to be brushed to have good oral health, majority (198, 47.2%) of them reporting that it should be started after 5 years of age. Only less than one in five parents/care takers (78, 18.5%) reported that a child's teeth should be brushed at least twice per day and closer to half of them reported that a child's teeth is brushed with a stick (200, 47.7%). Half of them (217, 51.4%) responded that gum bleeding during teeth brushing indicates unhealthy gum. (Table 2)

Table 2: Knowledge of parents/care takers about oral health of children, JMC, 2020

S. No	Variable	Category	Frequency	Percentage
1.	Does a child need to brush his/her teeth?	Yes	419	99.3
		No	3	0.7
2.	Child needs to brush his/her teeth starting from which age? N=419	6month	9	2.1
		1year	31	7.3
		2year	21	5.0
		3year	161	38.4

		Above5year	198	47.2
3.	How often within a day should child brush his/her teeth? N=419	Once in a day	182	43.4
		Twice in a day	78	18.5
		More than 2 times	58	13.8
		After every meal	102	24.3
4.	What oral hygiene method should be used for a child? N=419	Tooth brush	172	41.0
		Stick	200	47.7
		Water only	46	10.9
		Others	4	0.9
5.	How often do you think a tooth brush should be changed? N=172	After 2-3 months	27	15.6
		After 3-6 months	13	7.4
		Cannot decide	16	9.3
		When it is spoilt	99	57.4
		Not at all	18	10.3
6.	What does gum bleeding indicates?	Gum is healthy	12	2.8
		Gum is unhealthy	217	51.4
		I don't know	193	45.7
7.	What are signs of oral health problems?	tooth pain	74	17.5
		Gum bleeding	39	9.2
		tooth loss	35	8.3
		bad oral breath	271	64.2
		All	3	0.7
8.	Did you get information or counseling about how to keep your child's oral health?	Yes	273	64.7
		No	149	35.3
9.	From where did you get information	Electronic media	200	47.4

	or counseling? N=273	Health institution/s	67	15.9
		Print media	1	.2
		Others	6	1.4
10.	Poor oral health can complicate your child's clinical condition N=422	True	254	60.2
		False	168	39.8
11.	Knowledge status	< mean (<5)	200	47.4
		≥ mean (≥5)	222	52.6

5.3 Attitude of parents/care takers of children with chronic diseases about oral health

Over two third of the parents/care givers (297, 70.4%) reported that oral health is important for the overall health of their children and two third of them (275, 65.2%) responded that oral health is important in order to prevent bad breath whereas a third of them (136, 32%) responded that it is important to have regular dental visits for their children. (Table 3)

Table 3: Attitude of parents/care takers of children with chronic diseases about oral health, JMC, 2020

S. No	Variable	Category	Frequency	Percentage
1.	Oral health is important for overall health of your child	Yes	297	70.4
		No	125	29.6
2.	Oral health is important	To improve looks	103	24.4
		To reduce future dental treatment	10	2.4
		To keep the teeth as long as possible	34	8.1
		To prevent bad breath	275	65.2
3.	Regular dental follow up is	Yes	136	32.2

	important for children	No	155	36.7
		Don't know	131	31.0
4.	Treatment of toothache is as important as other organ in the body	Yes	199	47.2
		No	105	24.9
		I don't know	118	28.0
5.	Sweet diet will affect oral health	Yes	395	93.6
		No	27	6.4
6.	Attitude status	< mean (<3)	101	23.9
		≥ mean (≥3)	321	76.1

5.4 Practice of parents/care takers of children with chronic diseases regarding oral health of their children

Almost all (415, 98.3%) of the participants reported that they brush their children's teeth or the children brush their own teeth if they are old enough. However, only a quarter of them (107, 25.4%) brush their children's teeth twice per day as per the recommendation. Almost half of the participants (202, 48.6%) reported that they use locally prepared stick called "mefakiya (siwak)". Over a quarter of the parents/care givers (124, 29.4%) reported that their children had history of dental problem in the past but only few of them (16/124, 13%) were taken to health institution to seek treatment. (Table 4)

Table 4: Practice of parents/care givers of children with chronic diseases regarding oral health of their children with chronic diseases, JMC, 2020

S. No	Variable	Category	Frequency	Percentage
1.	Do you brush your child's teeth? / does your child brush his/her teeth?	Yes	415	98.3
		No	7	1.7
2.	Frequency of teeth brushing N=415	Twice per day	107	25.4
		Once per day	89	21.1
		Once per week	182	43.1
		Once per month	3	0.7

		After every meal	35	8.3
3.	Method used to brush child's teeth N=415	Tooth paste	174	41.2
		Stick	202	48.6
		Water only	37	8.8
		Others	3	.7
4.	Frequency of changing the tooth brush N=174	After 2-3 months	35	20
		After 3-6 months	15	8.6
		Cannot decide	13	7.4
		When it is spoilt	94	54
		Not at all	18	10
5.	Duration of brushing child's teeth N=415	1-2 min	141	33.9
		2-3min	105	25.3
		3-4min	55	13.2
		More than 4min	115	27.6
6.	Do you rinse your child's mouth with water after eating?	Yes	395	93.6
		No	27	6.4
7.	Did your child ever have oral health problem (caries, decay, tooth ache, infection, etc...)?	Yes	124	29.4
		No	298	70.6
8.	Did he/she seek treatment for it? N=124	Yes	16	13
		No	108	87
9.	If he/she didn't seek treatment for it, why? N=108	No clinic nearby	10	2.4
		High cost	32	7.6
		Fear	2	.5
		No reason	378	89.6
10.	What is your role in	Watch & advice	49	11.6

	supervision of your child's oral hygiene?	Only advice but do not watch	239	56.6
		Brush their child's teeth	73	17.3
		Never cared	61	14.5
11	Practice status	< mean (<5)	296	70.1
		≥ mean (≥5)	126	29.9

5.5 Socio demographic and clinical characteristics of children with chronic disease, JMC, 2020

A total of 422 children were included in the study; 219 (51.9%) of them were female and majority of them (223, 53.8%) were between the age of 7 and 13. From the total participants, 171 (40.5%) children had seizure disorder (epilepsy) (Table 5).

5.6 Oral health status of children with chronic diseases, JMC, 2020

Among the total participants, 127 (30.1%), had dental caries, the permanent teeth being affected in majority of the cases (103/127, 81.1%). Regarding the number of teeth affected with caries, most had only one tooth affected (59, 46.5%). There were 5 (1.2%) children who lost their teeth due to caries and 8 (1.9%) children had filled teeth which were affected with caries. At the end of the evaluation, 103 (23.7%) children were linked to dental clinic for further evaluation and management whereas 167 (39.6%) children were advised on preventive treatments like brushing regularly. (Table 5)

Table5: Socio-demographic and clinical characteristics and oral health status of children with chronic diseases, JMC, 2020

Variable	Category	Frequency	Percentage (%)
Age	3- 6 years	105	24.9
	7-13 years	223	52.8
	>13 years	94	22.4
Sex	Male	203	48.1

	Female	219	51.9
Type of chronic disease	Epilepsy	171	40.5
	Cardiac-disease	120	28.4
	Diabetes	67	15.9
	HIV/AIDS	64	15.2
Type of medication N=171	Phenytoin	96	22.8
	Phenobarbital	9	2.3
	Phenytoin & Phenobarbital	66	15.6
A child has oral health problem	Yes	145	34.4
	No	277	65.6
Type of oral health pathologies N=202	Dental caries	127	64.4
	Gum bleeding	35	17.7
	Dental erosion	5	1.2
	Enamel fluorosis	4	2
	Dental trauma status	5	2.5
	Oral mucosa lesion	26	13.2
Number of teeth affected with caries N=127	1	59	46.5
	2	35	27.6
	≥3	33	25.9
Dentition status of the affected teeth with caries	Primary	24	19
	Permanent	103	81

Intervention urgency	No Rx needed		
	Preventive / routine Rx needed	152	36.0
	Prompt Rx (including scaling) needed	167	39.6
	Urgent Rx needed due to pain or infection of dental/oral origin	100	23.7
		3	0.7

5.7 Factors affecting oral health status of the children with chronic illness

Before the final multiple logistic regression model, we did a bivariate logistic regression analysis to select candidate variables for multiple logistic regression model. The following were variables with p-value less than 0.25 on bivariate logistic regression and candidates for multiple logistic regressions: family monthly income, educational status of the parents/care givers, residence of parents/care givers, knowledge of parents/care givers about oral health, attitude of parents/care givers towards oral health, practice of parents/care givers towards oral health, age of the child and type of chronic disease (Table6).

Table 6 : Bivariate analyses for factors associated with oral health status of children with chronic disease attending pediatric follow up clinic at JMC, 2020

Variable	Poor oral health 145(34.3%)		COR	95%CI		P-value
	yes	No		Lower	Upper	
Age(care takers):						
<=30 years	27(32.5)	56(67.5)	1.036	0.601	1.787	0.899
31-40 years	43(25.0)	129(75.0)	0.774	0.493	1.216	0.266
>=41 years	57(34.1)	110(65.9)	1			
Income						
<= 2000	53(31.7)	114(68.3)	1.799	0.980	3.303	0.058
2001-4000	56(30.9)	125(69.1)	1.508	0.823	2.762	0.183
>=4001	18(24.3)	56(75.7)	1			
Educational status:						
Illiterate	52(39.7)	79(60.3)	2.525	1.344	4.744	0.004
1-8	48(28.1)	123(71.9)	1.639	0.885	3.035	0.116
9-12	10(76.7)	33(23.3)	1.420	0.614	3.283	0.412

TVET/College/university	17(22.1)	60(77.9)	1			
Residency:						
Urban	45(23.1)	150(76.9)	0.598	0.397	0.901	0.014
Rural	82(36.1)	145(63.9)	1			
Knowledge:						
Poor knowledge	86(43.0)	114(57.0)	2.841	1.873	4.311	0.000
Good knowledge	41(18.5)	181(81.5)	1			
Attitude:						
Poor attitude	38(37.6)	63(62.4)	1.592	1.006	2.519	0.047
Good attitude	89(27.7)	232(72.3)	1			
Practice						
Poor practice	103(34.7)	194(65.3)	2.122	1.318	3.416	0.002
Good practice	24(19.2)	101(80.8)	1			
Age of child:						
3-6	24(22.9)	81(77.1)	0.464	0.254	0.849	0.013
7-13	70(31.4)	153(68.6)	0.789	0.482	1.292	0.346
>13	33(35.1)	61(64.9)	1			

Type of chronic illness:						
Diabetes	28(41.8)	39(58.2) 44(68.8)	1.781	1.003	3.164	0.049
HIV	20(31.2)	88(73.3)	0.951	0.517	1.752	0.873
Cardiac	32(26.7)	124(72.5)	0.770	0.464	1.280	0.3143
Epilepsy	47(27.5)		1			

On multiple logistic regression analysis, the only factors associated with poor oral health status of the children were poor parental/care givers' knowledge about oral health and the type of chronic disease of the child. Children from parents/care givers with poor knowledge about oral health are 2.5 times more likely to have dental caries than children from parents with good knowledge (p-value=0.001, AOR=2.56, 95%CI [1.49, 4.39]) whereas those with diabetes are 2 times more likely to have dental caries as compared to children with epilepsy (p-value=0.036, AOR=1.96, 95%CI [1.05, 3.68]). (Table 7)

Table 7 Multiple logistic regression model predicting factors associated with oral health status of children with chronic disease attending pediatric follow up clinic at JMC, 2020

Variables	Poor oral health 145(34.3%)		COR	AOR	95% CI		P-value
	yes	No			Lower	Upper	
Income							
<= 2000	53(31.7)	114(68.3)	1.799	1.272	0.642	2.520	0.491
2001-4000	56(30.9)	125(69.1)	1.508	1.047	0.530	2.067	0.895
>=4001	18(24.3)	56(75.7)	1	1			
Educational status:							
Illiterate	52(39.7)	79(60.3)	2.525	1.552	0.673	3.440	0.313
1-8	48(28.1)	123(71.9)	1.639	1.333	0.654	2.717	0.429
9-12	10(76.7)	33(23.3)	1.420	1.194	0.487	2.924	0.698
TVET/College/university	17(22.1)	60(77.9)	1	1			
Residency:							
Urban	45(23.1)	150(76.9)	0.598	1.145	0.655	2.002	0.635
Rural	82(36.1)	145(63.9)	1	1			
Knowledge:							
Poor	86(43.0)	114(57.0)	3.330	2.565	1.499	4.390	0.001

Good	41(18.5)	181(81.5)	1	1			
Attitude:							
Poor	38(37.6)	63(62.4)	1.572	0.914	0.526	1.402	1.588
Good	89(27.7)	232(72.3)	1	1			
Practice							
Poor	103(34.7)	194(65.3)	2.234	1.706.	0.990	2.939	0.055
Good	24(19.2)	101(80.8)	1	1			
Age of child:							
3-6	24(22.9)	81(77.1)	1.826	0.522	0.273	0.999	0.050
7-13	70(31.4)	153(68.6)	1.182	0.852	0.500	1.453	0.557
>13	33(35.1)	61(64.9)	1	1			
Type of chronic illness:							
Diabetes	28(41.8)	39(58.2)	1.894	1.962	1.046	3.678	0.036
HIV	20(31.2)	44(68.8)	1.199	1.109	0.569	2.162	0.761
Cardiac	32(26.7)	88(73.3)	0.959	0.663	0.384	1.144	0.140
Epilepsy	47(27.5)	124(72.5)	1	1			

6. DISCUSSION

Oral health is not only about dental health, it is part of general health and wellbeing of a child. Dental caries is the most common oral health problem in pediatrics and it is increasing in developing countries like Ethiopia. Oral health of children depends on the awareness and attitude of their parents towards oral health (26).

In this study, almost all of the parents/caregivers knew that brushing their children's teeth is important, however; only few of them knew that it should be done at least twice per day which is comparable with other study (37) but lower compared to study done in India(38). Only very few participants knew that tooth brushing should be started as soon as the first tooth erupted (around 6 months of age) as per the recommendation. This finding is similar with study done in Mangalore (37) but is lower when compared with results from other studies (39-41) which could be explained by the socio demographic characteristics of the participants. Additionally, around 60% of parents/care takers knew that poor oral hygiene can complicate their children's clinical condition and 47.2% agreed that treatment of toothache is as important as treatment of other organ of the body. The finding is higher than that what was reported in Tikur Anbesa Hospital (32) but it is comparable with a study done in India (38).

The American Academy of Pediatric Dentistry recommends that a child should be seen by a dentist within 6 months of eruption of the first primary tooth and no later than 12 months of age and he/ she should have regular follow up visits (9). However, the result of this study showed that only less than one third of the parents agreed on the importance of regular follow up and even when their children had oral health problems, only very few (16, 12.9 %) of them took them to health care facilities to seek care, indicating that having the knowledge or attitude may not necessarily lead to good practice. This is similar with studies done in Tikur Anbesa Hospital which has shown 20.3% of participants agreed on importance of regular dental follow up but only 1% of them had regular dental visits (32). Other studies have also shown similar findings(38, 40, 42)

In our study, generally, the practice towards oral health is poor; even though majority (98.3%) of the participants brushed their teeth, only one quarter (107, 25.4%) of the children were brushing their teeth twice per day and 89 (21.1%) once per day. These finding is similar with study done in Alert and Tikur Anbesa Hospitals where 95% and 100% of children (respectively) brush their teeth and 27.5% and 21.3% of them respectively brush twice per day (32, 43). This finding is higher as compared to study done in other areas of Ethiopia (35). But it is lower than study performed in India where 56.3% of the participants brushed their teeth twice per day (38). These could be due to the difference in study area as well as the socio demographic characteristics of the study participants.

In this study, 41.2% of the children used toothpaste and tooth brush to clean their teeth, findings comparable with the study from Alert Hospital and Addis Ababa city in which 44.7% and 36.2% of the participants respectively were found to use tooth brush (34, 43) but, it is low as compared to other studies done in Kenya (95.4%) and Nepal (98%) (44, 45);the difference may be attributable to their socio-demographic characteristics.

According to AAPD, tooth brush should be changed every two to three months (9) but the result from our study showed that only 20% of the parents change their children's tooth brush as recommended, and only 25% of them brush their children's teeth for two to three minutes. This is unsatisfactory compared with results from other studies (42, 46).

Chewing plant derived tooth brush (chewing stick) is a common practice in Ethiopia as well as other parts of the world (47). Some studies show that chewing sticks have substances that have anti-bacterial activity against *Streptococci mutans* and other oral pathogens in addition to mechanical removal of plaque (48). In our study, 47% of the participants reported that they use stick for tooth brushing which is comparable finding with results from studies done in other parts of Ethiopia (34, 35). However it is higher compared with studies from other areas (45). Since these plants (sticks) have compounds that are active against common oral pathogens and are cheap compared to tooth brush or tooth paste, it might be of a great help for prevention of poor oral health for developing countries with low income and limited oral health care facilities. Due to incorrect use of tooth brush and low price of chewing sticks in poor countries, WHO also suggests that it is better to teach the population how to use the right type of chewing stick than preaching about the importance of tooth brush and tooth paste (36).

The prevalence of dental caries found in the present study (30.1%) was comparable with a study conducted in Gonder and Debre Berhan (33, 49). However, it is lower than study carried out in Addis Ababa, (47.4%) (34).

The result of this study showed that, despite good level of knowledge in almost half (52.6%) and good attitude in three fourth (76.1%) of the parents/ care givers towards oral health, majority (70%) of them seemed to be unable to apply it in every day practice. This shows that, different factors such as social, economic and environmental factors play an important role in translating a person's health related knowledge and attitude to good practice. There are different studies with similar findings (39, 43, 46).

Even though good knowledge and attitude of parents about oral health is not a guarantee for good oral health of the child, and must be translated to practice, this study established that, there is strong relation between good knowledge of parents towards oral health and decreased risk of poor oral health status of their children. This result contradicts with other studies (42).

7. Strength and limitation of the study

7.1 Limitation

The knowledge, attitude and practice of the parents was collected by asking themselves which might have introduced a bias since respondents might have given socially desirable responses.

7.2 Strength

In addition to assessing the KAP of parents, we carried out dental/oral examination of the children as well which might address the limitation we have indicated above.

8. Conclusion and recommendation

8.1 Conclusion

In conclusion, the parents/caregivers of children with chronic disease at JMC pediatric follow up clinic had good knowledge and attitude towards oral health. However, their practice is poor towards oral health of their children with chronic diseases. The prevalence of poor oral health is found to be high in children with chronic diseases in JMC.

8.2 Recommendation

The Departments of pediatrics and child health and Dentistry should work in collaboration to improve the knowledge, attitude and practices of parents/care givers as well as the oral health status of the children with chronic diseases. Particular recommendations include:

- Parental/caregivers' education and advice about oral health of their children should be part of routine care at the follow up clinics
- All health care workers taking care of the children with chronic diseases should assess the oral health of the children and provide the necessary treatment for those with oral health problem/s
- Educating parents/caregivers about the oral health of their children and starting practicing the appropriate oral hygiene as early as possible (as per the recommendation) should be part of the routine health education provided by health workers

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Annex 1

English questionnaire

Information sheet and mothers Consent form (English)

Information sheet

Good morning? / Good afternoon? My name is Dr.Amina Menbere. I am final year Pediatrics and Child health resident at Jimma University. I am conducting a study on assessment of oral health status of children with chronic disease and their parents'/caregivers' knowledge, attitude and practice towards oral health at JMC for my partial fulfillment of the requirements for the specialty certificate in Pediatrics and Child health. You are chosen to participate in the study. We need to collect data about socio-demography and economic information from you and the chart of your child. I want to assure you that all of your answers will be kept strictly secret. I will not keep a record of your name or address. You have the right to stop the interview at any time, or to skip any questions that you don't want to answer. Your participation is completely voluntary but your experiences could be very helpful to design a better action plan to mitigate associated morbidity/complications for the future.

If you agree to participate in the study, interview will take about 30 minutes to complete. Do you have any questions?

Consent form

Do you agree to be interviewed?

Yes No

May I begin the interview now?

To be signed by interviewer: I certify that I have read the above consent procedure to the participant.

Signed: _____

Guca heyyama maatii hirmaataa/ttu qorannoo kanaa

Akkam bultan?/Akkam ooltan? Maqaan koo Dr.Aminaa Menberee jedhama. Ani residentii pedatriksii fi fayyaa daa'immanii Jimmaa universitiiti. Qorannoo koo waa'ee fayyaa afaan daa'immanii dhukkuba hin fayyinee sassaabu fi beekumsa,ilaalchaa fi gocha maatii/namoota guddisaan waa'ee fayyaa afaan daa'immanii dhukkuba hin fayyinee JMC ti beekuu yoo ta'uu kunis akka ulaaga tokkooti waraqaa speshaalisti pedatriksii fi fayyaa daa'immani hojeecha jiruuf na fayyaada.Isinis qorannoo kana irraati hirmaachuf filatamtaanitu.Nutis kan barbaannu waa'ee jireenya hawwaasummaa,naannoo Fi madda galii keessanii fi kan da'immaani keessanii beekuu ta'a. Wanti isin beekuu qabdan iccitiin keessan guutummaan guutuutti kan eegameedha. Maqaan yookiin tessoon keessan galmee irrati hin galmeefamu.Yeroo kamiyyuu gaaffiicha addaan kutuuu yookiin immoo wanta deebisuu hin barbaannee dhisuun mirga keessaani. Hirmaanaan keessan guutummaan guutuutti fedha keessan irraatti hundaa'uus garuu muuxanoon keessan wanta gaarii hojjechuuf rakkoolee kana wajjiin walqabatan gara fulduraatti furuuf baay'ee barbaachisaa dha. Yoo qorannoo kana irraati hirmaachuuf waliigaltaan, xumuruuf naannoo daqiqqaa 30 gaafata.

Gaaffii qabduu?

Irraati hirmaachuuf walii galtanii?

Eeyyee-----

Lakkiii-----

Anii wanta armaan oliiti katabame irraati hirmaachuuf waliigaleera.

Mallattoo-----

የአማርኛ ቃለ መጠይቅ

የፈቃደኝነት መጠየቂያና የመረጃ ገጽ

የመረጃ ገጽ

ጤና ይስጥልኝ!

ስሜ ዶ/ር አሚና መንበረ እባላለሁ። በጅም ዩኒቨርሲቲ የመጨረሻ ዓመት የሕጻናት ሕክምናና የድህረ ምረቃ (ስፔሻሊስት) ተማሪ ስሆን ስር የሰደደ በሽታ (Chronic Disease) ያለባቸው ሕጻናት ልጆችን የአፍ ጤንነትና ቤተሰቦቻቸው ወይም አሳዳጊዎቻቸው ስለ ልጆች የአፍ ጤንነት ያላቸውን እውቀት፣ ግንዛቤና ልምድ በተመለከተ በጅም ዩኒቨርሲቲ የሕክምና ማዕከል የሕጻናት ክትትል ክፍል ውስጥ የመመረቂያ ጥናት እየሰራው እገኛለሁ። እርሶና ልጆም በዚህ ጥናት ላይ ተሳታፊ እንዲሆኑ የተመረጡ ሲሆን ስለ ሕጻኑ መረጃዎችን ከሕክምና መዝገብና ለእርሶ በምናቀርበው አጭር መጠይቅ የምንሰበሰብ ይሆናል። በዚህ ጥናት የሚሰበሰቡ መረጃዎች በሙሉ ከጥናቱ ዓላማ ውጪ ለሌላ ጉዳይ የሚይወሉና በሚስጥር የሚያዙ ሲሆን ስም እና አድራሻን መጥቀስ እንደማያስፈልግ ለመግለጽ ወዳለሁ። በማን ርዕደም ሠዕት መመለስ ያልፈለጉትን ጥያቄ ያለመመለስና እንዲሁም ከጥናቱ አቋርጦ የመውጣት ሙሉ መብት እንዳሉት ላሳውቅ እወዳለሁ።

በዚህ ጥናት የሚሰጡት መረጃ ሙሉ በሙሉ በፈቃደኝነት ላይ የተመሰረተ ሲሆን መረጃዎችን በመጠቀም ወደፊት በልጆች ላይ የሚከሰቱ ተመሳሳይ ችግሮችን ለመቅረፍ ይጠቅማል።

በጥናቱ ለመሳተፍ ከተስማሙ መጠይቁን ለመሙላት የሚወስደው 30 ደቂቃ ነው። ጥያቄ አሎት?

የፈቃደኝነት ቅጽ

በጥናቱ ለመሳተፍ ተስማምተዋል?

አዎ ተስማምቻለሁ አይ አልተስማማሁም

በመጥይቁ ሞዴው የሚፈረም፡ ከላይ በመረጃ ገጽ ላይ ያለውን ለጥናቱ ተሳታፊ በተገቢ ሁኔታ አንብቤ ማስረዳቴን በፊርማዬ አረጋግጣለሁ።

ASSENT FORM

My name is Dr.AminaMenbere. I work at jimma MedicalCenter to become Pediatrics and Child health specialist.

I am asking you to take part in this study because I am trying to learn more about oral health status of children with chronic disease and their parents'/caregivers' knowledge, attitude and practice towards oral health.

You are chosen to participate in the study. If you agree to participate you will be asked to open your mouth so that I can see your teeth, tongue and gingiva. This will take about 5 minutes.

You don't have to be in this study. No one will be mad at you if you decide not to be a part of this study. Even if you start, you can stop later if you want. You may ask question about the study.

If you decide to be in the study I will not tell anyone else what I find during the examination.

If you sign here, it means that you have read this form or have had it read to you, and that you are willing to be in this study.

Assent form

Do you agree?

Yes No

Signed: _____

Guca heyyama daa’ima hirmaataa/ttu qorannoo kanaa (umurii waggaa 10fi ol)

Maqaan koo Dr. Amina Menbere jadhama. Ani kutaa yaalumsaa fi fayyaa daa’immanii hospitaala jimmaa keessatti barattuu waggaa 3ffaa fi isa xumuraati.

Ijolllee dhukuba hinfayyinee qabbaattan waayee fayyaa affaan issanii, bekumsa, illaalcha fi gocha maattii/namootta gudissan irratti qorrano gochaan jirraa. Attis qorrano kana irratti aka hirmaattu filatamtettaa.

Qorrano kana irraa hirmachuf yoo walligaltte,affaan ke akka bantu niggafatamttaa. Annis affaan kee kessosaa(arrabakke, fon affaanke fi ilkkaan kee) nanllaalaa. Kunis daqiqaa shan fudhattaa.

Qorranno kana irra hirmaachu dhisun mirga ketti. Yoo hinhirmaaness tajaajilla fayyaa argattu irratti homaa dhibaa hinqabu. Yoo hirmachuf waligalttele,gidutti addaan kutu nidandessaa.

Yoo qorrano kana irratti hirmaatte,bu’aan qorrano ketti dhokssaa dhaan niqabamaa.

Malattokee yokesse, kannaan olitti kan dubifatte/kan sifdubifame hubate, qorrano kana irrati hirmaachuf waligaluke agarsisaa.

Waligaltettaa

Eeyee-----

lakki-----

Mallattoo-----

ለወጣቶች የፍቃደኝነት መጠየቂያና የሚጃጃ ገጽ(10 አመት እና ከዛ በላይ)

ስሜ ዶ/ር አሜ መንበረ እባላለው፡፡ በጀማ ዩኒቨርሲቲ የህጻናት ህክምና የደህረ ሚቃ ተሜ ነኝ፡፡ ስር የሰደደ በሽታያለባቸው ህጻናት የአፍ ጠፃነት ሁኔታ እና የወላጆቻቸውን ወይም ያላሳዳጊዎቻቸውን ስለልጆች የአፍ ጠፃነት ያላቸውን እወቀት ግንዛቤ እና ልምድ ለማወቅ ጥናት እያደረሁ ስለሆነ አንተ/ቺ የዚህ ጥናት አካል እንድትሆን/ኚ ተመርጠህል/ሻል፡፡

በጥናት ወስጥ ለመሳተፍ ፍቃደኛ ከሆንክ/ሽ አፍክን/ሽን ወስጠኛ ጥርስህን/ሽን ምላስህን /ሽን ድድህን/ሽን ማት ስለሚሰፈረው አፍህን/ሽን እንድትከፍት/ቺ ትጠየቃለሁ፡፡ ይህን ለማድረክ ጥናቱ ወስጥ ያለመሳተፍ ሙሉ መባት አለህ በጥናቱ መሳተፍ ካልፈለክ የሚደረግልህ የህክምና ክትትል አይቆረጥም፡፡ ጥናቱ በማንኛውም ሰዓት ማቋረጥ ትችላለህ/ትችያለሽ፡፡ ያልገባህን ጥያቄ መጠየቅ ትችላለህ/ሽ በጥናቱ ወስጥ ስምህ/ሽ በማንኛውም መልኩ አይጠቀስም እንዲሁም በምርመራ ወጠኑ የሚኘው ለማንም አይነገርም ፡፡

ከዚህ በታች ከፈረምክ/ሽ ከላይ የተጠቀሰውን አምበቢህ/ሽ ወይም ተነቦልክ/ሽ ሚዳትህንና/ሽን በጥናቱ ለመሳተፍ ፍቃደኛ መሆንን ያሳያል፡፡

ተስማምተህል/ሻል

ተስማማኛለው _____

አልተስማማም _____

ፊርማ-----

English questioner

Parental socio-demographic characteristics

1. Age: _____ years
2. Sex: A. Male B. Female
3. Relationship to the child:
 A. Father B. Mother C. Grandfather D. Grandmother E. Other
4. Monthly income: _____ETB
5. Educational level:
 A. None B. 1-4 C. 4-8 D. 8-12 E. TVET F. College/University
6. Residency
 A. Urban B. Rural
7. Religion
 A. Muslim B. Orthodox C. Protestant D. Others

II. Knowledge assessment questions

8. Does a child need to brush his/her teeth? A. Yes B. No
9. If yes to Q8, starting from which age?
 A. 6 month B. 1 yr C. 2 yrs D.3 yrs E. above 5 yrs
10. If yes to Q8, how often within a day?
 A. Once in a day B. Twice in a day C. More than 2 times D. After every meal
11. What oral hygiene methods do you use for your child?
 A. Tooth brush B. Stick C. Water only D. Others
12. If the answer to Q11 is tooth brush, how often should it be changed?
 A. After 2-3 months B.3-6 months C. cannot decide
 D. When it is spoilt E. Not at all
13. If there is gum bleeding what does it indicates?

A. Gum is healthy B. Gum is unhealthy C. I don't know

14. What are signs of oral health problems?

A. tooth pain B. Gum bleeding
C. tooth loss D. bad oral breath E. all

15. Did you get information or counseling about how to keep your child's oral health?

A. Yes B. No

16. If yes for Q15, from where?

A. Electronic media (Television, Radio) B. Health institute
C. print media D. others

17. Poor oral health can complicate your child's clinical condition?

A. True B. False

III. Attitude assessment questions

18. Do you think, oral health is important for overall health of your child?

A. Yes B. No

19. Why do you think oral health is important?

A. To improve looks B. To reduce future dental treatment
C. To keep the teeth as long as possible D. To prevent bad breath

20. Do you think regular dental follow up is important?

A. Yes B. No C. Don't know

21. Do you think treatment of toothache is as important as other organ in the body?

A. Yes B. No C. Don't know

22. Do you think sweat diet will affect oral health?

A. Yes B. No

Annex 2

The oral health of the children will be evaluated by using WHO oral health assessment form. (2013)

Card No.----- Type of chronic illness----- Type of medication- -----	Age----- Sex-----																																
Dentition status <div style="text-align: center; margin-bottom: 5px;"> 65 64 63 62 61 51 52 53 54 55 17 16 15 14 13 12 11 21 22 23 24 25 26 27 </div> <table border="1" style="width: 100%; height: 40px; border-collapse: collapse; margin-bottom: 5px;"> <tr><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td></tr> <tr><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td></tr> </table> <div style="text-align: center; margin-bottom: 5px;"> 85 84 83 82 81 71 72 73 74 75 47 46 45 44 43 42 41 31 32 33 34 35 36 37 </div>																															<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; vertical-align: top;"> primary A B C D E - F G - - </td> <td style="width: 50%; text-align: center; vertical-align: top;"> permanent tooth status 0 sound 1-caries 2-filed w/caries 3-filed no caries 4-missing due to caries 5-missingfor other reason 6-fissure sealant 7-fixed dental abutment 8-unerupted 9-not recorded </td> </tr> </table>	primary A B C D E - F G - -	permanent tooth status 0 sound 1-caries 2-filed w/caries 3-filed no caries 4-missing due to caries 5-missingfor other reason 6-fissure sealant 7-fixed dental abutment 8-unerupted 9-not recorded
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Periodontal status <div style="text-align: center; margin-bottom: 5px;"> 65 64 63 62 61 51 52 53 54 55 17 16 15 14 13 12 11 21 22 23 24 25 26 27 </div> <table border="1" style="width: 100%; height: 40px; border-collapse: collapse; margin-bottom: 5px;"> <tr><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td></tr> <tr><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td><td style="width: 25px; height: 20px;"></td></tr> </table> <div style="text-align: center; margin-bottom: 5px;"> 85 84 83 82 81 71 72 73 74 75 47 46 45 44 43 42 41 31 32 33 34 35 36 37 </div>																															Enamel fluorosis (10) <input style="width: 30px; height: 20px;" type="text"/> Status 0=normal 3=mild 1=questionable 4=moderate 2=very mild 5=sever 8=excluded(crown, restoration ,bracket) 9=not recorded(un erupted)		
Gum bleeding Scores 0-absence of condition 9-tooth occluded 1-presence of condition X-tooth not present																																	

<p>Dental erosion</p> <p>Severity</p> <p>(102) <input type="text"/></p> <p>0=no sign of erosion</p> <p>1=enamel lesion</p> <p>2=dentinal lesion</p> <p>3= pulp involvement</p> <p>No. of teeth</p> <p>(103) <input type="text"/> <input type="text"/> (104)</p>	<p>Dental trauma</p> <p>Status</p> <p>(105) <input type="text"/></p> <p>0=no sign of injury</p> <p>1=treated injury</p> <p>2=enamel # only</p> <p>3=enamel& dentin fracture</p> <p>4=pulp involvement</p> <p>5=Missing teeth by trauma</p> <p>6=other damage</p> <p>9=excluded tooth</p> <p>No. of teeth</p> <p>(106) <input type="text"/> <input type="text"/> (107)</p>	<p>Oral mucosa lesion</p> <table border="1"> <tr> <td data-bbox="667 222 935 533"> <p>condition</p> <p>(108) <input type="text"/></p> <p>(109) <input type="text"/></p> <p>(110) <input type="text"/></p> <p>0=no abnormal</p> </td> <td data-bbox="935 222 1167 533"> <p>location</p> <p>(111) <input type="text"/></p> <p>(112) <input type="text"/></p> <p>(113) <input type="text"/></p> <p>0=vermilion</p> </td> </tr> <tr> <td data-bbox="667 533 935 1211"> <p>condition</p> <p>1=ulceration(aphtos, herpes, traumatic)</p> <p>2= ANGU</p> <p>3=candidiasis</p> <p>4= abscess</p> <p>8=other condition</p> <p>9= nor recorded</p> </td> <td data-bbox="935 533 1167 1211"> <p>border</p> <p>1-</p> <p>2=lips</p> <p>3=sulci</p> <p>4=bucal mucosa</p> <p>5=fluor of mouth</p> <p>6=tongue</p> <p>7=hard&soft palate</p> <p>8=alveolar</p> </td> </tr> </table>	<p>condition</p> <p>(108) <input type="text"/></p> <p>(109) <input type="text"/></p> <p>(110) <input type="text"/></p> <p>0=no abnormal</p>	<p>location</p> <p>(111) <input type="text"/></p> <p>(112) <input type="text"/></p> <p>(113) <input type="text"/></p> <p>0=vermilion</p>	<p>condition</p> <p>1=ulceration(aphtos, herpes, traumatic)</p> <p>2= ANGU</p> <p>3=candidiasis</p> <p>4= abscess</p> <p>8=other condition</p> <p>9= nor recorded</p>	<p>border</p> <p>1-</p> <p>2=lips</p> <p>3=sulci</p> <p>4=bucal mucosa</p> <p>5=fluor of mouth</p> <p>6=tongue</p> <p>7=hard&soft palate</p> <p>8=alveolar</p>	<p>Intervention urgency</p> <p>(114) <input type="text"/></p> <p>0=no Rx needed</p> <p>1=preventive/routine Rx needed</p> <p>2=prompt Rx (including scaling) needed</p> <p>3=urgent Rx needed due to pain or infection of dental/oral origin</p> <p>4=referred for evaluation</p>
<p>condition</p> <p>(108) <input type="text"/></p> <p>(109) <input type="text"/></p> <p>(110) <input type="text"/></p> <p>0=no abnormal</p>	<p>location</p> <p>(111) <input type="text"/></p> <p>(112) <input type="text"/></p> <p>(113) <input type="text"/></p> <p>0=vermilion</p>						
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Thank you for your cooperation

Assurance of principal investigator

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and condition of the health science institute in effect at the time of grant is forwarded as the result of this application.

Name of the resident: Dr.Amina Menbere

Date _____ Signature _____

Approval of the advisors

Name of the first Advisor: Melkamu Berhane (MD, Associate Professor of pediatrics and child health)

Date _____ Signature _____

Name of second advisor: Bezawork Refissa (DMD, Assistant professor of Operative Dentistry and Endodontic)

Date _____ Signature _____