

Tooth Brushing Practice and its Determinants among Adults Attending Dental Health Institutions in Addis Ababa, Ethiopia

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Abstract

Introduction: Dental health problems are becoming priority public health problems throughout the globe. Primary prevention through tooth brushing is vital in addressing dental problems. **Objective:** The main aim of this study was to assess the tooth brushing practice and its determinants among adults attending dental clinic in Addis Ababa, Ethiopia. **Methods:** Across sectional study was conducted at 8 randomly selected dental health institutions to collect data from 384 adults attending dental services in Addis Ababa. Data were collected by interviewer administered pretested questionnaire. Logistic-regression was used to analyze the data. **Results:** A total of 384 respondents participated in the study. Only 89(28.8%) respondents knew the correct way of tooth brushing, 201(52.3%) perceived dental health is less important than other medical issues and 176(45.8%) respondents had a belief using toothpaste and tooth brush causes bad mouth breath. Seventy five (22.3%) respondents brush their teeth twice a day, 39(11.6%) brushed their teeth for two or more minutes and 12.4% flossed their teeth regularly. Respondents who had correct knowledge about tooth brushing and had positive feeling about tooth brushing were 8.32 (4.19-16.58) and 2.32 (1.37-4.61) times more likely to have correct tooth brushing practice respectively. Furthermore, respondents with secondary and above education had better tooth brushing practice compared to their counterparts 0.67(0.21-0.89). **Conclusion:** The practice of correct tooth brushing is low among study participants. Dental health education is recommended on the frequency, timing and techniques of tooth brushing.

Key Words: Tooth brushing, Dental health knowledge, Dental flossing, Dental caries, Dental plaque, Ethiopia

Introduction

Dental caries and periodontal diseases are priority public health problems throughout the globe [1-3]. If untreated, they affect quality of life and lead to anxiety, bad breath, tooth ache, difficulty in feeding; sleep loss, development of dento-facial anomalies and other serious health problems, such as dental abscess, destruction of bone and sepsis [4-8]. Primary prevention through tooth brushing has paramount importance in the prevention of dental health problems [9].

Tooth brushing twice a day is the recommended practice in the prevention and control of many dental diseases. However, the practice is varied and in some countries it is low. In a study conducted among Eastern Mediterranean adolescents it was shown only 30–60% of participants brushed their teeth twice a day [10]. In addition, it was only 44% of Iranian adolescents who brushed their teeth at least once daily [11]. In a dental hygiene habits survey of 41 countries across the WHO European region and North America it was 46-75% of the respondents who brushed their tooth more than once per day [12]. The percentage of study subjects brushing their teeth twice daily in India was 23% [13], Chinese urban adolescents 67% [14] and Kuwaiti adults 62% [15].

Assessing the tooth brushing practice of adults and identifying its determinants is vital in designing appropriate strategy in the prevention of dental problems and promotion of dental health. However, such studies are very scarce in Ethiopia. Thus, it is the purpose of this study to assess the tooth brushing practice of adults and identifying its determinants.

Materials and Methods

This study was conducted in Addis Ababa the capital city of Ethiopia using a cross-sectional study design. The sample size

was calculated using single population proportion formula with the assumption of 95% confidence interval, 50% prevalence of tooth brushing practice and 5% desired precision. Based on this the total sample size was 384.

From the 52 dental clinics in Addis Ababa eight dental clinics were selected randomly. From each selected clinic all clients who come to the clinic for dental services each day were interviewed until the assigned sample size is reached.

Interviewer administered questionnaire was employed to collect data. The questionnaire was adapted from review of previous literatures [16-18]. The questionnaire consisted of four parts with a total of 41 questions. The first part included the socio-demographic characteristics of the study participants composed of 6 questions. The second part is composed of 35 questions related to knowledge about tooth brushing, attitude about tooth brushing and tooth brushing practice of study participants.

The questionnaire was prepared in English and translated in to Amharic, then back to English to check for consistency of meaning. Finally the Amharic version was used for data collection. Pre-test was conducted in dental clinics not selected for the study. Two days training was given for data collectors and supervisors. The training was given on the objective of the study, interviewing techniques and ethical considerations in collecting data.

Correct way of tooth brushing is defined as tooth brushing using either or a combination of the six tooth-brushing techniques (Horizontal Scrub Method, Bass Method, Stillman's Brushing Technique, Charter's Brushing Technique, Fone's (circular) Brushing Technique and Roll Stroke Brushing Technique) twice or more in a day for two to three minutes.

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Data entry, cleaning and coding was done using Epi Info version 3.5.4 statistical package and exported to SPSS window version 20 for analysis. Associations between variables were assessed by using odds Ratio, 95% Confidence Intervals. Logistic-regressions were used to adjust for possible confounding variables.

Ethical approval was obtained from the Research and Publications committee of Atlas College. A formal letter of permission and support were written to the selected clinics. Verbal informed consent was obtained from each participant after explaining the purpose and procedure of the study.

Results

A total of 384 respondents participated in this study which makes the response rate 100%.

Background characteristics of the respondents

The socio demographic characteristics of respondents participated in the study is shown in *Table 1*. Of the 384 respondents 202(52.6%) were males and 182(47.4%) were females and 176(45.8%) were between the ages of 20-29 and 105(27.3%) in the age group of 30-39 years. The mean and median age of the study population was 33.7(SD: 10.28) and 30 years respectively.

Table 1. Socio demographic characteristics of adults attending dental health services in Addis Ababa, June 2014.

Variable	Type/Range	Number	%
Sex	Female	182	47
	Male	202	53
Age	20-29	176	46
	30-39	105	27
	40-49	65	17
	50-59	35	9.1
	60 and above	3	0.8
Educational status	Illiterate	4	1
	Read and write	9	2.3
	Elementary	124	32
	High school	112	29
	University/College	135	35
Religion	Orthodox	227	59
	Protestant	101	26

	Catholic	2	0.5
	Muslim	50	13
	Others	4	1
Ethnicity	Amhara	185	48
	Oromo	107	28
	Tigre	28	7.3
	Somali	23	6
	Guragie	19	4.9
	Hadiya	13	3.4
	Others	9	2.3
Occupation	Daily Labor	28	7.3
	Civil servant	78	20
	Private organization	22	5.7
	Own business	186	48
	Other	66	17

Over all 227(59.1%) of the respondents were Orthodox Christians, 50(13.0%) were Muslims, 185(48.2%) were Amhara and 107(27.9%) of the respondents were Oromo by ethnicity. Of all 186(48.4%) were self-employed and 163(42.4%) completed higher education.

Oral health knowledge

More than three quarter of the respondents heard about dental health. From 309 respondents who heard about dental health 78(25.2%) of the respondents got the information from television, 68(22.0%) from family and 66(21.4%) from dentists.

Over all 129(41.7%) of the respondents had correct knowledge about the meaning of dental plaque, 116(56.0%) of the study participants knew where dental plaque occurs and 85(41.1%) correctly answered the consequence of dental plaque as well as 64(30.9%) of the respondents replied that regular tooth brushing prevents the formation of dental plaque.

From all the respondents 141(45.6%) said that dental caries is caused by bacteria and food remnants in oral cavity and 113 (36.6%) and 98(31.7%) of the participants responded that dental caries can be prevented by mouth rinsing after meal and tooth brushing respectively.

It was only 89(28.8%) of the respondents who knew the correct techniques of tooth brushing (*Table 2*).

Table 2. Knowledge about tooth brushing among adults attending dental health services in Addis Ababa, June 2014.

Variable	Number	%
Heard about Dental Health		
Yes	309	80.5
No	75	19.5

Source of information about dental health* n=309		
Television	78	25.2
Family	68	22
Dentists	66	21.4
Friends	59	19.1
Radio	45	14.6
Books	4	1.3
Pamphlets	8	2.6
Teachers	7	2.3
Dental plaque is n:309		
1. Debris on tooth surface	129	41.7
2. Staining of the teeth	51	16.5
3. Liquid in enamel surface	27	8.7
4. Never heard about dental plaque	102	33
Where does dental plaque stick to in the mouth n:207		
1. On the teeth	116	56
2. On the gum	42	20.3
3. On the tongue	24	11.6
4. All	6	2.9
5. I don't know	19	9.2
Dental plaque leads to n:207		
1. Dental caries	85	41.1
2. Staining of the teeth	71	34.3
3. Inflammation of gum	33	15.9
4. Crack of tooth	2	0.9
5. I don't know	16	7.7
Prevention of dental plaque n:207		
1. Mouth rinsing after meal	59	28.5
2. Brushing regularly	64	30.9
3. Visit dentist	7	3.4
4. Use of fluoride	18	8.7
6. All of the above	37	17.9
7. I don't know	22	10.6
Cause of dental caries n:309		
1. Evil spirit	12	3.8
2. Dental caries insects	11	3.6
3. Bacteria and food remnants in oral cavity	141	45.6
4. Viruses and worms	17	5.5
5. I don't know	128	41.4
Knowledge of prevention of dental caries n:309		
1. Mouth rinsing after meal	113	36.6

2. Use good testing tooth paste	30	9.7
3. Tooth brushing before going to bed	98	31.7
4. I don't know	68	22
Gum bleeding is n:309		
1. Inflamed gum	178	57.6
2. Gum recession	10	3.2
3. I don't know	121	39.2
Gum bleeding be prevented n:188		
1. Brushing the teeth	49	26.1
2. Flossing	31	8
3. Using vitamin C	46	24.5
4. All of the above	33	17.6
5. I don't know	29	15.4
Correct way of brushing n:309		
1. Move the brush back and forth	52	16.8
2. Brush up from the bottom and down from the top with circular motion	89	28.8
3. Brush in circular motion	25	8.1
4. Move the brush from front of teeth to back	63	20.4
5. I don't know	80	25.9
* multiple response is possible		

Attitude towards tooth brushing

A total of 201(52.3%) respondents had a perception that dental health is less important compared to other medical health issues and 182(47.4%) said they will have a bad filling if they lose a tooth as much as they get sick in other parts of their body .

In addition, 153(39.8%) of the respondents do not consider that tooth brushing is an important factor in improving dental health and 179(46.6%) of the respondents had a feeling that tooth brushing do not prevent problem of the gum. Moreover

264(64.1%) of the respondents believe that it is easier to use traditional stick than tooth brush with toothpaste and 176(45.8%) had negative attitude to the use of toothpaste and tooth brush saying that it leads to bad mouth breath.

More than half 208(54.2%) of the respondents had a belief that they should visit a dentist only if they have tooth pain and 168(48.3%) do not think eating and drinking sweet things without cleaning teeth is harmful to teeth. Overall, 141(36.7%) of the participants perceived they have poor dental health (*Table 3*).

Table 3. Attitude towards tooth brushing among adults attending dental health services in Addis Ababa, June 2014.

Variable	Number	%
Dental health is less important than other medical health issues.		
Yes	201	52.3
No	183	47.7
I would feel bad if I lose a tooth as much as if I get sick in other part of my body.		
Yes	202	52.6
No	182	47.4
Tooth brushing is an important part of improving dental health.		
Yes	231	60.2
No	153	39.8

Brushing teeth will keep from having trouble with gum.		
Yes	205	53.4
No	179	46.6
Using a tooth brush with toothpaste is more difficult than using a traditional stick.		
Yes	246	64.1
No	138	35.9
Using toothpaste and tooth brush causes bad mouth breath.		
Yes	176	45.8
No	208	54.2
I don't think I should visit the dentist unless I have tooth pain		
Yes	208	54.2
No	176	45.8
Eating and drinking sweet things without cleaning teeth are harmful to teeth.		
Yes	216	56.3
No	168	48.3
Perceived dental health :		
1. Very good	44	11.5
2. Good/average/	137	35.7
3. Poor	141	36.7
4. I don't know	62	16.1

Tooth brushing practice

The majority of respondents 337(87.8%) reported that they brush their teeth, of these 201(59.6%) use traditional brushing tool and 136(40.4%) tooth brush with tooth paste.

Regarding, the frequency of brushing 169(50.1%) of the study participants brush their teeth occasionally, 93(27.6%) once daily and 75(22.3%) twice or more in a day. Furthermore, concerning the time of cleaning it was only 75(22.3%) that cleaned their teeth in the morning after breakfast, 11(3.3%) before going to bed and 119(35.3%) cleaned whenever they remember. It is only 39(11.6%) respondents who brushed their teeth for two or more minutes. A total of 89(23.2%) respondents reported they floss their teeth. Of these, 11(12.4%) floss regularly and only 19(21.3%) of the respondents used professional dental floss. Moreover, it was only 75(22.3%) of the respondents who cleaned their tongue while they brush their teeth. More than there quarter of the respondents take sugary foods (*Table 4*).

Table 4. *Tooth brushing practice among adults attending dental health services in Addis Ababa, June 2014.*

Variable	Number	%
Do you clean your teeth?		
1. Yes	337	87.8
2. No	47	12.2

What tools do you use to brush teeth n=337		
1. Traditional brushing tool	201	59.6
2. Tooth brush with tooth paste	136	40.4
How frequently do you clean your teeth? n=337		
Occasionally	169	50.1
Once a day	93	27.6
Twice or more in a day	75	22.3
For how long do you brush your teeth?		
Less than one minute	84	24.9
One minute	67	19.9
two or more minutes	39	11.6
I don't have definite time	147	43.6
When do you usually clean your teeth n=337		
1. Morning before breakfast	127	37.7
2. Morning after breakfast	75	22.3
3. Noon before lunch	5	1.5
4. Before going to bed	11	3.3
5. Whenever I remember	119	35.3
If you use tooth brush, how often do you change it? n=136		
1. Every month	27	19.8

2. Every three months	38	27.9
3. Every six months or more	41	30.1
4. Never ,unless I loss it or dirty it	23	16.9
5. I don't know	7	5.1
Do you floss?		
1. Yes	89	23.2
2. No	295	76.8
What tools do you use for flossing n=89		
1. Professional dental floss	19	21.3
2. traditional tool	70	78.7
When do you floss? n=89		
1. Regularly	11	12.4
2. When something enters in to my teeth	47	52.8
3. When I feel I should	31	34.8
Do you clean your tongue while brushing your teeth? n=337		
1. Yes	75	22.3

2. No	262	77.7
Do you take sugary foods?		
1. Yes	303	78.9
2. No	81	21.1

Determinant factors of tooth brushing

Bivariate and multivariate analysis was performed to identify factors associated with tooth brushing practices (*Table 5*). On the multivariate analysis three factors were associated with correct tooth brushing practices. Respondents who had correct knowledge about tooth brushing were 8.32 (4.19-16.58) times more likely to have correct tooth brushing practice. Moreover, positive attitude to tooth brushing was associated also with proper tooth brushing practice. Participants who had positive feeling about tooth brushing were 2.32 (1.37-4.61) times highly likely to have right tooth brushing practices. Furthermore, respondents with secondary and above education had better tooth brushing practice compared to their counterparts (0.67) (0.21-0.89) (*Table 5*).

Table 5. Factors affecting tooth brushing practice of adults attending dental health services in Addis Ababa, June 2014.

Variable	Tooth brushing practice		Crude OR (95 CI)	AOR (95 CI)
	Yes	No		
Age				
20-40	35	147	0.65(0.41-1.07)	
41-60	54	148	1:00	
Sex				
Female	32	150	0.54(0.21-0.93)	0.49(0.18-1.12)
Male	57	145	1:00	1:00
Educational status				
Below secondary	29	108	1:00	1:00
Secondary and above	60	187	0.84(0.39-0.96)	0.67(0.21-0.89)*
Knowledge about tooth brushing				
Yes				
No	61	37	15.19(7.34-22.15)	8.32(4.19-16.58)*
	28	258	1:00	1:00
Attitude towards tooth brushing				
Positive				
Negative	59	117	2.99(1.42-5.89)	2.32(1.37-4.61)*
	30	178	1:00	1:00

Discussion

The study assessed the tooth brushing practice and its determinants among adults attending dental clinics in Addis Ababa. The study showed it was only 66(21.4%) of the respondents who got information about dental health from

dentists. This finding is lower than the findings from Vietnam and Sweden study [16,17].

Respondents in this study had low knowledge about dental health problems and tooth brushing compared to previous studies [17,19]. This difference may be due to the less attention given to dental primary prevention by the concerned

bodies and the wasted opportunities by dentists to provide dental health education during dental health visits.

Misconception is widespread regarding oral health and about tooth brush and tooth paste. Nearly 47.7% of respondents in this study think that dental health is less important than other medical health issues. This is lower than the Vietnam study [16]. A significant number 176(45.8%) of respondents in this study perceive using toothpaste and tooth brush causes bad mouth breath. Therefore, oral health programs should spotlight on transmitting correct information and eliminate this misconception.

Proper tooth brushing practice prevents the development of dental health problems and has effect on the quality of life and general health of people. However, the majority of respondents didn't follow correct tooth brushing practice. It was only 22.3% of the respondents who brush their teeth twice in a day, 39(11.6%) respondents who brushed their teeth for two or more minutes and 12.4% of the respondents flossed their teeth regularly. This finding is lower than the findings of previous studies [15,18-23]. This underscores the need for educating the public about proper tooth brushing through mass media, each dental visit and mobilizing community health and extension workers.

This study pin pointed that respondents who completed secondary and above education brushed their teeth more than the less- educated ones, which is in an agreement with earlier studies [15,22]. Tooth brushing practice was not statistically influenced by gender in this study. This concurs with results from previous studies [24,25]. An encouraging finding of our study is the association between correct knowledge about tooth brushing and correct tooth brushing practice. Similarly, favorable attitude towards tooth brushing was significantly associated with correct tooth brushing practice. This is in conformity with extant literatures [18,26]. Thus, providing factual information and increasing the knowledge of the public about proper techniques and ways of tooth brushing needs to be highlighted in oral health educational programmes for enhancing better tooth brushing practice.

Conclusion

The result of this study signifies for dental health education about the frequency; timing and techniques of tooth brushing, as a negligible number of respondents had low knowledge about tooth brushing and a significant association was observed between good knowledge of tooth brushing as well as positive attitude towards tooth brushing and tooth brushing practice.

Further experimental study is needed to investigate the determinants of dental health practice. The study used probability sampling techniques, adequate sample size and used appropriate statistical methods to minimize biases. However, it is difficult to ascertain causality as the study is a cross sectional design.

Abbreviations

A.A: Addis Ababa, AOR: Adjusted Odds Ratio, CI: Confidence Interval, COR: Crude Odds Ratio, OR: Odds

Ratio, SPSS: Statistical Package for the Social Sciences, WHO: World Health Organization

Competing interest

The authors declare that they have no competing interests.

Authors contribution

All authors involved in the design, analysis and preparation of the manuscript. All authors have read and approved the final manuscript.

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