ORAL HEALTH EDUCATION AND PRACTICES AMONG COMMUNITY MEMBERS IN CENTRAL DIVISION, MACHAKOS DISTRICT, KENYA

BY

MUTINDA AGNES KASUSU (HD. ICN – RN)


Signature ----------------- DATE ------------------

30.6.2008

A RESEARCH THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PUBLIC HEALTH IN THE SCHOOL OF HEALTH SCIENCES OF KENYATTA UNIVERSITY.

JUNE, 2008

Mutinda, Agnes Kasusu
Oral health education and practices among
DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature ___________________ Date 30. 6. 2008

Mutinda Agnes Kasusu

157/ 6474 / 03

Supervisors: This thesis has been submitted for examination with our approval as University supervisors.

Signature ___________________ Date 30-06-2008

Dr. Michael F. Otieno (PhD)

Department of Pre-clinical Sciences,

Kenyatta University

Signature ___________________ Date 30. 06. 2008

Dr. Faith W. Muli (PhD)

Department of Biochemistry,

Kenyatta University
DEDICATION

This thesis is dedicated to my mother, Mrs. Rebecca Kalondu for teaching me hard work and honesty as a child, and to Joan Syomiti my only daughter.
ACKNOWLEDGEMENTS
Special appreciation to my supervisors Dr. Michael F. Otieno, and Dr. Faith W. Muli who worked closely with me and for encouragement even during hard times.
I am sincerely grateful to Dr. Isaac J. Mwanzo, Dr. Lawrence P. Oteba of the department of Public health, Kenyatta University for their tireless assistance and guidance in writing this project.
Sincere thanks to the community in Central Division for their co-operation during the time of data collection, the administration of the Central Division of Machakos District for allowing me to collect data, and for giving me people to guide me in the area.
My sincere gratitude to all my family members who encouraged and prayed with me through my work.
Sincere thanks to Mr. Steve Muunda for organising and typing my work.
To my friends, I sincerely say thank you for the special prayers and wishes.
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ABBREVIATIONS AND ACRONYMS

WHO- World Health Organization
AIDS- Acquired Immunodeficiency Syndrome
HIV- Human Immunodeficiency Virus
MOH- Ministry of Health
SPSS- Statistical package for Social Sciences
CBS- Central Bureau of Statistics
OHE – Oral Health Education.

This refers to the process of oral health education and promotion to enhance personal oral health through the knowledge and confidence in oral health education, which is good in prevention of dental and oral disease.

1. Regular brushing at least twice in a day for the duration of 1 minute.
2. Visit to a dentist at least once a year for dental checkup.
3. Avoidance of sugar and between meals.
1.8 Operational definition of terms

For the purpose of this study, the following terms were defined as follows

Oral hygiene practices

This includes various methods used by various people to achieve good oral hygiene. This can be achieved by use of various devices such as toothbrush, toothpick, chewing stick and toothpaste.

Oral hygiene

This refers to the presence or absence of plaque debris and calculus, which cause tooth decay.

Tooth Extraction

Defined as removal of a tooth.

Utilization of oral health services

Refers to visits to an oral health facility/ dentist.

Knowledge

Knowledge was defined as having information on the three prime messages on Oral health education, which is used in prevention of oral diseases. The messages considered were,

1) Regular brushing of teeth at least twice in a day, in the morning and before bed

2) Visits to a dentist at least once or twice in a year for dental check up.

3) Avoidance of sugary diet between meals.
Tooth mortality

Refers to tooth loss.

Alternative medicine

Used here to refer to other form of treatment other than medical treatment in a medical oral health facility, such as traditional medicine.

Periodontal disease

Defined as inflammation of the gums of teeth leading to destruction of gums that lead to loose tooth and subsequent loss.

Dental caries

Gradual decay of a tooth or death of a bone as a result of chronic infection.

Plaque

Mass containing food debris and bacteria in between teeth that eventually causes tooth decay.
ABSTRACT

Although oral health problems are not life threatening, they are of public health concern globally due to their high prevalence, morbidity, general discomfort and negative effects on the overall quality of life. The underprivileged and rural communities are the most affected in both developed and developing countries. Poor distribution of oral health facilities, equipment and qualified personnel for the services have been implicated as some of the obstacles for people's acquisition of oral health services in Kenya. The aim of this study was to examine Oral health education and practices among community members in Central Division of Machakos District. Data for the study was drawn from a cross sectional survey of community members in Mumbuni and Mutituni locations in April and May 2006. The data was collected using pre-tested self-administered questionnaires and interviews. Cluster sampling was used to select a sample of 391 respondents. The collected data was cleaned, coded, scored, then entered into the computer and analyzed using SPSS Statistical package. Descriptive statistics such as the mean, standard deviation, range and percentages were worked out to describe data. Pearson- Chi-square was used to test statistical associations between variables. The variables considered were utilization of oral health services (visits to the dentist) as the (dependent) variable and oral hygiene practices, availability of oral health services, accessibility to oral health services, alternative treatment of oral diseases and oral health education (awareness) as the (independent) variables. Level of significance was fixed at 0.05 (p=0.05). The results of this study revealed that there was no relationship between distance from area of residence and visits to the dentist p > 0.05 as the respondents were forced to seek health care by urgent health needs. Further, a statistical significant difference was observed in tooth brushing habits among gender and age groups as females observed better oral health care practices than males p<0.05 and the youngest group 15-24 years compared to other groups p< 0.05 respectively. Tooth brushing habits were personal, not significantly associated with visits to the dentist p >0.05. Majority of the respondents (77.5%) brushed teeth using industrial toothbrush / chewing stick and paste which are considered as the correct tooth cleaning devices. Oral health services were provided as 94% of the respondents were treated upon presentation to the dentist. Majority of the respondents (61.9%) had never sought oral health care, which is a major requirement in prevention and early diagnosis of oral diseases. Among those who never visited a dentist, (83.8%) believed they should only visit when they have oral health problems. Urgent 'need' (85.3%) or when there were oral health problems was the main reason of visiting a dentist, as was in painful tooth (52%). Most of the respondents presented themselves late, with advanced disease for treatment and tooth extraction (82.9%) was the treatment of choice. Oral health education, which is mainly preventive, was poor among all age groups, as there was no significant difference observed p>0.05. Only (30.4%) of the respondents had received various oral health messages mainly from teachers in schools. This study recommends strengthening of oral health services in the study community by provision of trained manpower to teach oral health education and for early diagnosis of oral diseases. The education should aim to motivate the individuals to self-oral health care. The results of this study would greatly contribute in designing interventions geared towards change of people's attitudes on utilization of oral health services.
CHAPTER ONE: INTRODUCTION

1.1 Background

Oral health describes the well being of oral cavity including the dentition, its supporting structures and tissues. It is the absence of disease and the optimal functioning of the mouth, which preserves the highest level of self-esteem. (WHO, 1999). Oral diseases affect all human beings irrespective of age, location, nationality, colour, race, social or economic status (WHO, 1999). “You are not healthy without good oral health” (Koop, 2000). Oral health means more than good teeth. It is integral to general health and essential for well being (WHO, 2005). Oral diseases restrict activities, cause psychosocial complications and often significantly diminishes quality of life (Owino, 1996). Early detection of these diseases is crucial to saving lives, as most of them are preventable (WHO, 2000). Oral diseases are on the increase in developing countries especially oral thrush as a result of HIV and AIDS infection and periodontal disease (Owino, 1996). Dental caries affects about 60 – 90% of populations in developed countries as a result of poor dietary habits, which include consumption sugary diets (WHO, 2000). It is less common and severe in Africa, though studies have shown a reversing trend as a result of changing lifestyles in dietary habits in urban areas (Akpabio, 1985). Research in developed countries report a spectacular fall in prevalence of dental caries due to the introduction of National policy on preventive measures, promotion of oral hygiene, use of tooth paste, introduction of fluoride into drinking water or salt, regular dental checkup and advice on nutrition (Owino, 1996). Adequate financial support, available physical resources and managerial skills to combat and prevent the diseases have been a contributing factor (Lesan, 2000). Surveys in France, Bulgaria and Indonesia have shown where community prevention programmes are set up, there is a reduction in the prevalence
of oral diseases (Owino, 1996). Increase in oral diseases in Africa is associated with poor socio-economic status, under development, lack of trained personnel for the services, policy on promotion and prevention programmes (WHO, 1999). The poor and the rural majority are the most affected (MOH, 1999). Africa faces an acute lack of recent reliable, comparable data that addresses oral health priorities and for planning (MOH, 1999; Ng’ang’a, 2002).

In Kenya, lack of recent reliable data on oral disease prevalence has made it difficult to initiate meaningful planning and delivery of services (MOH, 1999). This together with poor facility infrastructure and staff shortage, leaves out the populations unattended especially the rural majority (Lesan, 2000). This accounts for 50% of the Kenyan population (Lesan 2000). Studies (Nzioka et al, 1993) indicate majority of the people are not aware of the presence of the disease until informed by physicians. This has brought negative effects on the part of the population with 90% of the diseases untreated (Lesan, 2000). Ng’ang’a (2002) recommended “a National census for oral diseases in Kenya” since most of the studies done give conflicting results on the disease situation and cannot be used for planning.

The WHO emphasizes the importance of promotion and preventive programmes, change of the present professional orientation from curative to preventive and individual behavioral change (WHO, 1994). Oral diseases are preventable through maintenance of oral hygiene, optimal use of toothpaste and nutritional advice, which cost very little and is perfectly suitable for implementation in primary health care (Owino, 1996). Dental caries has been identified as the major cause of tooth decay, with dental extractions as the main form of treatment in Kenya (Kaimenyi et al
Reports indicate most people visit the dentists with advanced, severe and late symptoms of dental diseases for treatment (Kaimenyi et al; Bruce et al, 2001). Tooth loss has its consequences of disfigurement leading to loss of aesthetics and beauty, inability to chew leading to malnutrition and general poor health, social cost and poor speech (Maina, 1987; Nzioka et al, 1993). If unchecked oral diseases could threaten socio-economic development of this Nation and could lead to generalized poor health. It therefore calls for studies to establish the magnitude of the disease burden and prevalence of each of the diseases afflicting each of the communities in Kenya. In addition there is need to establish the extent of the community’s oral health service utilization as this is a dominant factor in prevention of oral diseases. The findings will assist in development of meaningful and effective interventions.

1.2 Statement of the Problem

Oral health in African countries is given poor attention as resources and materials provided for health activities is directed to controlling communicable diseases and life-threatening conditions (Lembariti, 2001 b). The countries operate at the ill-end of the spectrum and preventable diseases such as periodontal disease and dental caries continue to ravage the populations (WHO, 1999). These diseases are the major cause of tooth Extractions (Kaimenyi, 1993; Lesani, 2000). The magnitude of the disease burden is mainly in the rural populations where accessibility and availability of services have been a problem (WHO, 1999; Lesan, 2000). In most African countries, utilization of oral health services have been associated with lack of disease awareness, availability of services, accessibility to services and lack of time to visit clinics (Ewen, 1994; Bruce et al, 2001). Kenya’s oral health delivery system shares these and has experienced myriad problems since independence (Lesan, 2000). Utilization of
oral health services has been dictated by availability of trained personnel and services (Lesan, 2000). The services have been mainly curative, with unevenly distributed oral facilities concentrated in District and provincial hospitals (Lesan, 2000). This has further been complicated by training of few dentists, who are curative oriented and ill-prepared for preventive services. These professionals mainly work in urban areas (Lesan, 2000). This scenario has given better care to urban dwellers and left out the rural majority (Kaimenyi, 1993). It is estimated about 50% of Kenyans have no access to oral health services and about 90% of the diseases remain untreated (Lesan, 2000).

Shortage of reliable data for planning and reporting on prevalence of oral diseases has given rise to conflicting information being given to the population regarding oral disease situation in the country (Ng’ang’a, 2002). This makes implementation of services difficult (MOH, 1999). However, in the above status, Kenya is one of the few developing countries with fairly equipped oral health facilities / dental clinics capable of offering a wide range of dental treatments (Wakianga et al, 1996). Attempts are occasionally made to offer dental health education to patients in some of these clinics and during dental action week (Wakianga et al, 1996). There is however an emerging concern that, despite the availability of these services/ facilities majority of patients report for attendance when in urgent need, in pain and late to save their teeth (Kaimenyi, 1993). This usually ends with tooth extractions and a high tooth mortality has been observed among Kenyan population with similar observations elsewhere in Africa (Kaimenyi, 1993). An example of other African countries is Ghana’s main
hospital, Korle Bu (Bruce, 2001), who reported 76.9% of dental treatments was by
dental extraction. Earlier at Kenyatta National Hospital Kenya, Likimani 1983) reported 65 – 75% of dental treatments constituted of tooth extractions. KNH being a National referral hospital reflects to a large extent the prevailing situation in other dental clinics in Kenya (Kaimenyi et al, 1987). This scenario still prevails, and Machakos District oral health facility is one of these examples where between the year 2003 and 2004, a significant number, (80%) of patients who reported to the hospital oral health facility had their teeth extracted (MOH, 2004). The hospital has a functional oral health facility, qualified personnel and subsidized treatment costs (MOH, 2004). The oral health facility is situated in central division and serves all attendance’s and referrals from the rest of the district.

1.3 Purpose of the Study

The purpose of this study was therefore to establish oral hygiene practices and factors that have contributed to poor utilization of oral health services even when they were available. Although sporadic oral health researches have been conducted, they have not explained factors underlying failure to seek oral health care and dental treatment at the earliest opportunity in most of the communities in Kenya.

1.4 Research Questions

This study has attempted to answer the following research questions:

1. What is the community’s oral hygiene practices and how does it relate to utilization of services?
2. What is the extent of the community's utilization of oral health services provided in the study area?

3. What other method(s) of oral disease treatment is existent in the community?

4. What is the extent of oral health education coverage and source of oral health information in the study community?

1.5 Null Hypothesis

1) Oral hygiene practices are not related to the utilization of oral health services.

1.6 General objective

The overall objective was to determine dental (oral) health education and practices among community members in Central Division, Machakos District.

1.6.1 Specific objectives.

1. To determine oral hygiene practices in prevention of oral diseases among the community in Machakos District

2. To determine the existence or coverage of oral health services and the extent to which the community in Machakos District utilizes them.

3. To investigate alternative oral health treatment among the community members.

4. To establish if the community receives oral health education and the source of the Information.
1.7 Justification/Significance

Good oral health is integral to general health. It is a basic human right, and all Kenyans have a right to it. Oral health education has proven to be the most effective method in prevention of oral diseases in developed and some developing countries (Owino, 1996). To date, Kenya has not implemented health policy on prevention of oral diseases (MOH, 1999; Ng’ang’a, 2002). This has further been complicated by absence of recent reliable data, which makes planning on oral health difficult (Ng’ang’a, 2002). As a result, the country has experienced confusion due to conflicting information resulting from different researches (Ng’ang’a, 2002; MOH, 1999). This study sought to narrow this gap by providing relevant information relating to poor utilization of oral health services by the sample population even when they are available. Further this study highlights the extent of oral health education information dissemination within the study community. The MOH may utilize the findings in development of relevant interventions. The findings could be useful in the development of policies for the country and for regional comparison. In addition the study has provided basic information for future reference, shedding light on the magnitude of the disease burden in the study area. It is hoped that the community would benefit from being sensitized on oral health risks which result from poor oral health practices and tooth extractions, enabling them to initiate informed preventive measures.
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Health is a basic right and oral health is a significant component of general health (WHO, 1994). Although oral diseases are not life threatening they are important public health problems, because of their high prevalence, morbidity, general discomfort and negative effects on the overall quality of life (WHO, 2000; Lembariti, 2001). In addition the financial impact on individual and community is very high and this is going to increase due to infection control measures of infectious diseases such as HIV/AIDS (WHO, 1994). At present, the distribution and severity of oral diseases vary among different parts of the world and within the same country or region (WHO, 2000). Oral diseases known to exist in each community need to be addressed in terms of basic epidemiological criteria of prevalence and severity in order to develop intervention programmes with which to address them (WHO, 1999).

2.2 Determinants of Oral Health Problems in Africa

Prevalence of oral diseases in developing countries has been attributed to lack of policy on oral health promotion and prevention programmes (WHO, 1994). The major determinants of oral health in Africa includes poverty, motor accidents causing trauma, HIV/AIDS scourge causing oral manifestations of diseases such as candidiasis, harmful cultural practices of removal of tooth/teeth, trimming of anterior teeth or sharpening, and lack of trained personnel to provide for oral services (WHO, 1999). A Survey by (Akpabio, 1985) in Nigeria showed observable increase in the prevalence of oral diseases especially dental caries as a result of urbanization, and in some of the rural communities. In African countries (WHO, 1999), studies indicate
widespread poverty and underdevelopment to expose the communities to all major
determinants of oral diseases.

2.3 Epidemiological Distribution of Oral Diseases

The significant role of socio-behavioural and environmental factors in oral health is
evidenced in a number of epidemiological surveys. The commonest of the oral
diseases in the World has historically been dental caries and periodontal disease
(WHO, 1999; WHO 2005). Dental caries affects about 60 – 90% of populations in
developed and some Asia countries (Owino, 1996). Studies in Africa have shown
prevalence of dental caries to have substantial variations, most of these 90% remain
untreated (WHO, 1999; Akpabio, 1985). The trend in the prevalence and severity of
dental caries in Africa should be seen within the context of socio-cultural and
economic changes within the region with rising income and urbanization in Africa
(Owino, 1996; Akpabio, 1985). There has been clear switch from dependence on
traditional starchy and fibrous staple foods to consumption of fine carbohydrates
(Owino, 1996). Periodontal disease is estimated to affect about 40-75% of populations
in some African countries as a result of poor oral hygiene regardless of socio-
economic status or location (WHO, 1999). The two diseases, dental caries and
periodontal diseases are the major causes of tooth/teeth decay, which leads to tooth
extractions (Lesan, 2000). In Tanzania (Mumghamba, 2003) showed periodontal
status in a rural population to be very poor with nearly 100% with the disease
manifestations. In Ghana’s major hospital Korle Bu, studies report (76.9%) of dental
treatments was by dental extractions (Bruce, 2001). The cause of these was (83%)
due to dental caries and (17%) due to periodontal disease. Oral manifestation of HIV /
AIDS is highly prevalent in Africa as a result of the AIDS pandemic in the region (Owino, 1996).

2.4 Prevention of oral diseases

Methods and techniques of prevention of oral diseases are simple, cost very little and are perfectly suitable for implementation into primary health care (Owino, 1996). These include maintenance of good oral hygiene, optimal use of toothpaste and nutritional advice on reduction of sugary diet (Akpabio, 1985). Published studies in Bulgaria, France and Thailand have shown where community prevention programmes have been set up, some diseases such as dental caries stop advancing (Akpabio, 1985). The reports attribute the success due to introduction of national policies on preventive measures, promotion of oral hygiene, widespread use of toothpaste, introduction of fluoride into drinking water or salt and advice on nutrition (Owino, 1996). Adequate financial support, available physical resources and managerial skills to combat and prevent these diseases have been a factor (Lesan, 2000). Most African countries lack these policies on oral health and its healthcare operate at the ill end of the spectrum, where emphasis is on curative rather than preventive (WHO, 1999). Kenya’s plan on oral health has been planned on inadequate selective studies which do not reflect the national situation as pertains to oral health (MOH, 1999). Preventive and promotive health strategy has not been implemented which often gives confusing and conflicting information to the public regarding oral diseases (MOH, 1999). Ng’ang’a, (2002) recommends “a National census for Oral diseases in Kenya” to establish the magnitude of oral diseases based on epidemiological data.
2.5 Utilization of oral health services and manpower development

One of the parameters of oral health utilization is the number of people accessing the health services offered at the oral health institution (Bruce et al., 2001). The cost of dental care is very high in both developed and developing countries. Oral diseases are the fourth most expensive to treat in developed countries (WHO, 2005). In some countries like Britain, cost of dental care absorbs about 5 – 11% of its National health budget (Owino, 1996). Utilization of oral health services has been associated with lack of diseases awareness, accessibility to the services, availability of services and lack of time to visit dental clinics (Ewen, 1994). In Kenya availability of services, functional facilities, trained staff and accessibility to services have been a factor (Lesan, 2000). Kenya’s oral health facilities are concentrated in Provincial and District hospitals giving urban dwellers better care (Lesan, 2000). Despite the availability of these oral health facilities, records available reveal many Kenyans report to oral health facilities when forced by pain and therefore in need of urgent attention, a phenomenon observed in many parts of this country and in Africa at large (Kaimenyi, 1993). This lead to tooth loss which cause difficulty in feeding and malnutrition, disfigurements with loss of self- esteem, poor speech and generalised poor health (Owino, 1996; Maina, 1987; Nzioka et al, 1993).

The reasons for the poor utilization of the available services need to be investigated and an entry point to solutions found in order to improve oral health for Kenyans. The benefits of good oral health include fresh breath, good smile, good feeding/nutrition which leads to generalised good health and self-esteem (WHO, 2005). Training of dentists in Kenya was not harmonized with the countries needs of services which created a discrepancy on the type of services offered to the population (Lesan, 2000).
Dentist / population ratio is 1:60,000 far below the WHO recommended ratio of 1:2000, therefore there is shortage of dentists in Kenya (MOH, 1999; Lesan, 2000). In developed countries like Sweden and USA where ratio of dentists is 1:900 and 1:1300 respectively, dental surgeons have not been able to meet the demand (Lesan, 2000). This therefore, is an indication of the magnitude of deprivation of dental services to the Kenyan population (Lesan, 2000). To address the problem, formulation of a new concept of training and change of tact in delivery of services need to be adopted. This could be realised by training of other health workers to provide manpower. The Ministry of health funds allocation on oral health is very small, this constrains the services more especially outreach services (Ndungu, 1987). This has further rendered the existing trained staff idle due to lack of equipment, consumables and poor maintenance protocol. It is estimated that half the population in Kenya has no access to dental care (Lesan, 2000).

The WHO (1994) emphasizes the importance of oral health promotion and preventive programmes through primary health care. Though Kenya implemented primary health care in 1986, and oral health is one of its elements, oral health care services has not been properly implemented (Lesan, 2000). The services are mainly dictated by availability and accessibility to qualified staff, facilities including equipment and supplies (MOH, 1999). The World Health Assembly (1994) emphasizes the need to formulate community-based programmes for oral health workers at all levels particularly at district level. Kenya would benefit in training of its health work force in order to reach more people through primary health care delivery system.
CHAPTER THREE: MATERIALS AND METHODS

3.1 The study area

The study was carried out in Mutituni and Mumbuni locations of Central Division, Machakos District, in the Eastern Province of Kenya. Machakos is approximately 64 km to the East of the City of Nairobi and 16 km off Nairobi - Mombasa road. The district borders Nairobi City and Thika District to the west, Kajiado to the southwest, Makueni to the south, Maragua and Mbeere to the north. On the eastern side are Mwingi and Kitui districts. The district covers 6281 sq. km and is divided into 12 administrative areas, which include Central, Kathiani, Mwala, Athi river, Yathui, Katangi, Yatta, Masinga, Ndithini, Kalama and Kangundo. The location of Machakos District administrative boundaries is shown on (page 16) and position of Machakos District in Eastern Province is shown on (page 15). The District has 62 locations and 225 sub-locations, a population of 1042490 persons, population density of 144 persons per sq. km, growth rate of 3.5 children (Population projection 2004). There is 160 health facilities distributed in the 12 divisions, which deals with preventive, promotive and curative services (CBS, 1999).

The study area, which is a rural setting, is located on the outskirts of Machakos town and is accessible through a tarmac road that stretches about 11km from the town and a network of earth roads.

The main economic activities in the division are agriculture and livestock production, which support about 70% of the population. Majority of the parcels of land are small holdings under 2 hectares each. Subsistence farming is dominant, with coffee grown as the main cash crop. Other crops grown are maize, beans, vegetables and a variety
of fruits. The remaining 30% of the population derive their livelihood from commercial activities and employment both in private and public sector. Poverty level stands at 60%, malnutrition is rampant and chronic water shortage (CBS, 1999).

Machakos District oral health facility is situated in central division and caters for all oral health attendance and referrals from the rest of the District. An average of 4,554 persons attend the oral health facility for services annually or 380 persons monthly with an average daily attendance of 13 persons. This has so far been found to be poor. Similar observations have been made in other oral health facilities in Kenya (MOH, 1999). The general attendance in this oral health facility is representative of those who attend other oral health facilities in other Districts in the country. The findings of the study could allow for a wider generalization on utilization of oral health services by community members in Kenya.
MAP OF KENYA SHOWING POSITION OF MACHAKOS DISTRICT IN EASTERN PROVINCE

POSITION OF MACHAKOS DISTRICT IN EASTERN PROVINCE

WESTERN PROVINCE

RIFT VALLEY PROVINCE

CENTRAL PROVINCE

NAIROBI PROVINCE

NYANZA PROVINCE

COAST PROVINCE

NORTH EASTERN PROVINCE

EASTERN PROVINCE
3.2 Study population

The study population comprised of community members considered to be in age group of adult activities (15-60 years) which includes courtship, marriage, sex, and reproduction. In addition, this is the time of career building and public life. Good oral health and teeth is therefore essential as it enhances beauty, fresh breath and attraction in courtship, sexual relations, marriage and reproduction. In addition, it promotes good nutrition needed in overall quality life, body development and enhances self-esteem in public life. Children below 15 years and adults above 60 years were considered to be on the lesser side of these activities. Poor oral health brings negative effects on these vital life functions. The community can influence good or poor oral health practices.

3.2.1 Inclusion criteria

Community members who gave informed consent, whose ages fell in the (15-60 yrs) age bracket and living in the study area.

3.2.2 Exclusion Criteria

Community members who declined to give consent, did not fall within the selected (15 – 60yrs) age bracket and not living within the area of study were excluded from the study.

3.3 Research Design

This was a cross-sectional descriptive survey. In this survey, information was collected from a sample and the findings were used to make conclusions about the population. It involved systematic collection and presentation of data to give a clear
picture of the problem under investigation. Both qualitative and quantitative methods of data collection were used (Verkevisser, 1993)

3.3.1 Variables

The variables considered for the study were, oral hygiene practices, availability of health services, alternative treatment of oral diseases, accessibility to oral health services, oral health education (awareness) as the (independent) variables, and utilization of oral health services (visits to a dentist) as the (dependent) variable

3.4 Sampling techniques and sample size determination

3.4.1 Sampling techniques

Cluster sampling was used to select the study subjects. A list of all the 9 locations of Central Division of Machakos District (clusters) was made and two locations Mutituni and Mumbuni were randomly selected using simple random method by lottery. A list of all the villages in the two sampled locations was made and two villages from each location were similarly randomly selected. This made a total of four villages. The selected villages were Kyanganga and Kyanguli in Mutituni Location and Kateve and Mikuni in Mumbuni location. Random selection of the locations and villages ensured equal inclusion of the study subjects. All households in the selected villages qualified to be members and were included in the study. Only members in the selected households who met the inclusion criteria for the study were interviewed
3.4.2 Sample size

Sample size was arrived at by calculation using the formula as used by Fisher et al; 1998, (Mugenda and Mugenda, 1999) and shown here below

\[ \text{N} = \frac{Z^2pqD}{d^2} \]

Where \( \text{N} \) = Sample size

\( Z \) = The standard normal deviate (1.96) corresponding to 95% confidence Interval

\( p \) = The proportion of the target population estimated to have Oral diseases

Prevalence of oral diseases is unknown in Kenya due to unavailability of standardized data (MOH, 1999; Ng’an’ga, 2002). According to Fisher et al; (1998) where prevalence is unknown, 50% should be used. Therefore for this study, \( p = 0.5 \).

\( d \) = The level of statistical significance set = 0.05

\( q = 1 - p = 0.5 \)

\( D \) = The design effect = 1

Thus \( n = \frac{1.96^2 \times 0.5 \times 0.5 \times 1}{0.05 \times 0.05} = 384 \text{ People} \)

So a larger sample of 391 respondents was interviewed.
3.5 Data collection process

3.5.1 Construction of research instruments

To collect data, a questionnaire was developed, pre-tested and used as self-administered questionnaire and interview schedule. The questionnaire had the same type of structure and information to avoid different questions asked and getting different responses. The structure consisted of open-ended and closed-ended questions. Open-ended questions permitted free responses whose content was analyzed and reported verbatim. Closed-ended questions offered a list of possible options or answers from which the respondent was free to choose (sample questionnaire is shown in appendix i). The questionnaire was developed in accordance with the objectives and hypotheses of the study, pre-tested in English and translated verbally into Kiswahili and Kamba languages where necessary.

3.6 Preparation for the study

A pilot survey or pre-testing of the questionnaire was carried out in two villages of the two sampled locations involving one village in each location. A total of 50 people were interviewed. The survey was meant to identify potential problems in the proposed study, assess the effectiveness and reliability of the questionnaire. This eventually determined their suitability for use in the study. Data obtained from pilot survey was used to moderate the final questions. The pilot survey was completed in 5 days.

3.7 Data collection techniques and procedure

Field work (data collection) involved going from house to house to interview the study subjects individually, using structured questionnaire or giving the structured
questionnaire to individual participants to fill. Prior to filling, instructions were given to the respondents on how to fill in the questionnaire. The investigator continually checked the questionnaires to ensure all information had been collected and recorded appropriately. The filled questionnaires were collected the same day. On the average, 8-10 study subjects were interviewed daily. In total, a sample of 391 study subjects was recruited in this study. The survey was contacted in the month of April and May 2006, and was completed in 6 weeks and 3 days.

3.8 Ethical considerations

Permission to carry out research was sought from the Ministry of Science and Technology after approval by the Graduate School of Kenyatta University (Approval letter in Appendix ii). Further permission was obtained from the offices of the area chiefs who informed the sub-chiefs and village elders. The village elders provided a person who guided the researcher in the study area. The opinion leaders were informed to enhance community acceptance. To enhance community response rate and to allay fear, respondents were assured that interviews were not to test for intelligence but for the study. Participation was voluntary. Filling of questionnaire and interview schedule was on one to one basis to ensure privacy. The information obtained was kept in strict confidence and respondents were made aware of this. The questionnaires were maintained blind so that information given was anonymous. To guarantee this, the respondents were not required to write their names and were made aware of this. The study subjects who were selected for the study did so on voluntary basis and all of them gave their consent after the objectives of the study were explained. Referrals were made for respondents with medical and oral health problems for checkup and treatment.
3.9 Assessment of knowledge on the three prime health messages given in oral health education (OHE)

To test the knowledge on oral health education, the respondents were asked to state the three prime health messages given in OHE. The messages considered were;

(1) Regular brushing of teeth at least twice in a day, morning and before bed.

(2) Visits to a dentist at least once or twice in a year for checkup with or without oral health problems.

(3) Avoidance of sugary diet between meals.

The prime messages were grouped and Linkert scale was used to rate them as follows;

No message- 0 and was rated- poor

One message- 1 and was rated – fair

Two messages- 2 and was rated - fairly good

Three messages- 3 and was rated- good.

Oral health education basically centers on the three prime messages. The respondents who mentioned the three messages were deemed to have good knowledge and therefore qualified to the (variable) knowledge on oral health. This is because omission of any of the messages will predispose the respondents to poor practices and oral diseases.

3.10 Data management and analysis

Data collection in the field was continually quality controlled by the investigator. This involved continuous checking of data to ensure completeness of information and internal consistency. Each questionnaire was numbered. The raw data was edited, classified and tabulated. The process involved coding, computer entry and analysis. All-open-ended questions were coded before entry. After data entry, the spreadsheet
was inspected for accuracy. The statistical package for social sciences (SPSS) software was used to analyse data. For quantitative data, descriptive statistics such as the mean, standard deviation, range and percentages were worked out initially to describe data. Person’s Chi-square was used to test relationships and significance between categorical variables such as accessibility to services, availability of services, alternative treatment, knowledge on oral health education (independent) variables and utilization of oral health services (visits to a dentist) as the (dependent) variable. The variables were measured at ratio scale of measurement. Level of significance was fixed at 0.05 (p=0.05). Results were presented in descriptive form using frequency tables, cross tabulations, charts, percentages and figures.
CHAPTER FOUR: RESULTS AND DISCUSSION

4: RESULTS

This chapter specifically deals with data analysis and interpretation of results or findings. Data was analyzed as per the objectives and hypotheses of the study. Descriptive statistics were used to analyze quantitative data such as percentiles, mean, standard deviation and range. Chi-square tests were used to test relationships and significance between variables. Linkert scale was used to rate oral health messages. The results were interpreted and summarized then presented in form of tables, graphs and charts to illustrate the findings. Finally the findings are discussed as per the objectives of the study and appropriate/ relevant interpretation made.

The first part of this chapter deals with the characteristics of the study subjects

4.1 The response pattern of the study subjects

A total of 391 respondents participated in this study. Among these, 350 answered the researcher-administered questionnaire while 41 preferred the self-administered questionnaire. The respondents were co-operative and willing to participate in this study.

Table (1) shows the distribution of the study subjects.
Table I. Distribution of the study subjects by age and gender

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24 years</td>
<td>80</td>
<td>74</td>
<td>154 (39.39%)</td>
</tr>
<tr>
<td>25-34 years</td>
<td>56</td>
<td>39</td>
<td>95 (24.30%)</td>
</tr>
<tr>
<td>35-44 years</td>
<td>45</td>
<td>26</td>
<td>71 (18.16%)</td>
</tr>
<tr>
<td>45-54 years</td>
<td>22</td>
<td>22</td>
<td>44 (11.25%)</td>
</tr>
<tr>
<td>55-60 years</td>
<td>15</td>
<td>12</td>
<td>27 (6.91%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>218 (55.8%)</strong></td>
<td><strong>173 (44.2%)</strong></td>
<td><strong>391 (100%)</strong></td>
</tr>
</tbody>
</table>

N=391

As shown in (table 1), a total of 218 (55.8%) females and 173 (44.2%) males with an age range between (15 - 60 yrs), a mean of (31.38 yrs), Standard deviation of (12.435 yrs) were interviewed. The females were the majority (55.8%). The youth in 15-24 year age group (39.39%) were the most represented.
4.2 Oral hygiene practices

Figure 1. Distribution of respondents by frequency of tooth brushing

![Bar chart showing frequency of tooth brushing]

\[ N = 391 \]

Figure (1) above shows that 194 (49.6%) of the respondents brushed teeth once in a day, 130 (33.3%) twice, 62 (15.85%) three times, 2 (0.5%) four times. Only 3 (0.8%) never brushed their teeth at all. This study revealed that out of the 391 respondents, 388 (99.2%) reported to brush teeth regularly and only 3 (0.8%) never brushed their teeth at all.
Table 2 Respondent’s use of tooth cleaning devices and toothpaste in maintenance of oral hygiene.

<table>
<thead>
<tr>
<th>Type of tooth cleaning device</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Tooth brush and tooth paste</td>
<td>274</td>
</tr>
<tr>
<td>Chewing stick and tooth paste</td>
<td>27</td>
</tr>
<tr>
<td>Chewing stick and salt</td>
<td>36</td>
</tr>
<tr>
<td>Tooth brush alone</td>
<td>15</td>
</tr>
<tr>
<td>Chewing stick alone</td>
<td>32</td>
</tr>
<tr>
<td>Tooth brush, chewing stick and paste</td>
<td>2</td>
</tr>
<tr>
<td>Other means (charcoal, tooth picks)</td>
<td>1</td>
</tr>
<tr>
<td>Did not respond</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>391</td>
</tr>
</tbody>
</table>

Further to maintenance of oral hygiene, the study sought to find the common devices that the respondents used to clean their teeth. Table 2 above shows the commonest device used to brush teeth by the respondents was conventional toothbrush and toothpaste 274 (70.1%), followed by chewing stick and salt (9.2%). The others were chewing stick alone 32 (8.2%), chewing stick and toothpaste 27 (6.9%) and toothbrush alone 15 (3.8%). The rest used both chewing stick, conventional toothbrush and paste 2 (0.5%), other means 1 (0.3%). Only 4 (1.0%) did not indicate what they used. The findings indicate (77.5%) of the respondents used either industrial toothbrush/chewing stick and paste, which are recommended for tooth brushing in maintenance of oral hygiene.
Table 3. Distribution of the respondents by number of times one brushed teeth

<table>
<thead>
<tr>
<th>Time when one brushes</th>
<th>No. of respondents</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the morning, before bed (once)</td>
<td>193</td>
<td>49.4%</td>
</tr>
<tr>
<td>Morning and after lunch, Morning and before bed (twice)</td>
<td>136</td>
<td>34.8%</td>
</tr>
<tr>
<td>Before bed, morning and after lunch, After meals (three times)</td>
<td>58</td>
<td>14.8%</td>
</tr>
<tr>
<td>Did not respond</td>
<td>4</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>391%</td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Further to oral hygiene practices, (table 3) above shows that a total of 193 (49.4%) of the respondents brushed their teeth once in a day in the morning or before bed. Those who brushed twice in the morning and before bed, in the morning and after lunch were 136 (34.8%). Those who brushed three times in the morning, after lunch, after meals and before bed were 58 (14.8%). There were 4 (1.0%) none respondents. The result show 49.4% of the respondents brushed teeth once and a slight majority 49.6% brushed teeth more than once at various times respectively.
4.3 Utilization of oral health services

4.3.1 Visits to a dentist

Table 4 Shows response pattern of respondents on visits to a dentist

<table>
<thead>
<tr>
<th>Response</th>
<th>No. of respondents</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>150</td>
<td>38.4%</td>
</tr>
<tr>
<td>No</td>
<td>241</td>
<td>61.6%</td>
</tr>
<tr>
<td>Total</td>
<td>391</td>
<td>100%</td>
</tr>
</tbody>
</table>

N= 391

The study determined utilization of health services by the respondents. Table 4 above shows that out of the total number of 391 respondents interviewed, 61.6% had never visited a dentist while only (38.4%) had visited the oral health facility. For good oral health care, one requires visiting a dentist once or twice in a year for checkup (Owino, 1996). The results therefore show that (61.6%) of the study subjects who have never visited the dentist did not observe the basic oral health care practices required in prevention of oral diseases. This could have been contributed by lack of awareness or the respondents may have ignored.

4.3.1.1 Represents frequency of visits to the dentist in a year

Table 5 shows the last time the respondents visited a dentist in a year

<table>
<thead>
<tr>
<th></th>
<th>0-1year</th>
<th>2 years</th>
<th>3-5years</th>
<th>&gt; 5 years</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>38</td>
<td>40</td>
<td>66</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Percentage</td>
<td>25.3%</td>
<td>26.7%</td>
<td>44%</td>
<td>2.7%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

N = 150
With regard to the last time the respondents visited a dentist, table 4 shows that 38 (25.3%) had visited within a year ago, those who visited within 2 years were 40 (26.7%). A slight majority had visited within 3-5 years 66 (44%). Those who had visited more than 5 years were 4 (2.7%), and 2 (1.3%) did not indicate when they last visited. This table therefore indicates that majority (74.7%) of the visits to a dentist occurred within more than 1 year. This shows the respondents did not observe basic oral hygiene practices of visiting a dentist for checkup once or twice in a year.

### 4.3.1.2 Frequency of visits to a dentist in a year

**Figure 2. Frequency of visits to a dentist to seek oral health services**

**No. of times one visited a dentist in a year**

*N=150*

Further to utilization of oral services, it was found necessary to determine the frequency of visits to a dentist in a year. Figure 2 above shows 10 (6.7%) of the study subjects visited once, 10 (6.7%) visited twice, 128 (85.3%) visited when there was need. Only 2 (1.3%) of the respondents did not indicate how often they visited. The results indicate that majority of the respondents (85.3%) visited the dentist due to "need" or health problems with their teeth therefore ignoring basic oral health care which requires regular checkup once or twice in a year.
4.3.2 Oral health problems commonly encountered and availability of services

Table 6 represents the various oral health problems necessitating health care

<table>
<thead>
<tr>
<th>Reasons</th>
<th>No. of respondents</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Painful tooth</td>
<td>78</td>
<td>52.0%</td>
</tr>
<tr>
<td>Hole on the tooth</td>
<td>42</td>
<td>28.0%</td>
</tr>
<tr>
<td>Dental check up</td>
<td>7</td>
<td>4.6%</td>
</tr>
<tr>
<td>Other combined reasons – Hole, painful tooth, swollen jaw, injury, bleeding gums</td>
<td>22</td>
<td>14.6%</td>
</tr>
<tr>
<td>Not Answered</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>150</td>
<td>100%</td>
</tr>
</tbody>
</table>

N = 150

In respect to reasons that made the respondents to visit a dentist, Table 6 above shows that the respondents had various oral health problems that made them to seek treatment. The main problems presented were painful tooth (52.0%) followed by a hole in the tooth (28.0%). Other reasons such as hole and painful tooth, swollen jaw, injury and bleeding gums were (14.6%). Only (4.6%) reported for dental check up. Those who did not give reasons for visiting a dentist were (0.7%). This therefore shows (94.7%) of the respondents visited the dentist due to pressing and urgent problems as a result of advanced disease symptoms. Preventive measures were poorly observed with only (4.6%) of the respondents reporting for consultation. It was also a clear indication of the presence of oral diseases among the respondents.
Table 7 shows the reasons that made the respondents not to seek oral health care

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number of respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never had a dental problem</td>
<td>186</td>
<td>77.2%</td>
</tr>
<tr>
<td>Dental treatment expensive</td>
<td>25</td>
<td>10.4%</td>
</tr>
<tr>
<td>No time to visit a dentist</td>
<td>5</td>
<td>2.1%</td>
</tr>
<tr>
<td>See no point in visiting a dentist</td>
<td>13</td>
<td>5.4%</td>
</tr>
<tr>
<td>Scared of dental treatment</td>
<td>6</td>
<td>2.5%</td>
</tr>
<tr>
<td>No dental problem/ see no point of visiting</td>
<td>3</td>
<td>1.2%</td>
</tr>
<tr>
<td>without a problem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not respond</td>
<td>3</td>
<td>1.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>241</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

N=241

With regard to those that had not visited a dentist, table 7 above shows that (77.2%) of the respondents said they have never had a dental problem. Others (10.4%) said dental treatment is expensive, (5.4%) said they see no point unless they had a problem, (2.5%) said they are scared of dental procedures. The remaining (2.1%) said they had no time/ permission from work, (1.2%) said they have had no dental problem and see no point unless they had a problem. Only (1.2%) did not respond to the question. The results show that (83.8%) of the study subjects believed they should see a dentist only when they had problems. These results suggest the respondents ignored or may not have been aware of the services provided by the dentists.
4.3.2.1 Oral health services offered at the oral health facility

Figure 3 Treatment advised and received at the oral health facility

The study sought to find if there were oral health services offered at the oral health facility. As shown in (figure 3), services were provided as per the diagnosis upon presentation to the dentist. These included tooth extractions, filling of the teeth, cleaning of teeth, advice on oral hygiene and medication. Among those who visited the oral health facility, (82.9%) were advised to have their teeth removed, (2.0%) were advised on cleaning of teeth, (4.7%) referred to come later after medications, while (2.0%) were advised to improve on oral hygiene. Others, (7.4%) were advised to improve on oral hygiene, had filling and cleaning of teeth. In total (82.9%) of the respondents who reported to the clinic were treated by tooth extraction due to
advanced disease. However a small percentage (18%) were advised to seek various modes of treatments that could save their teeth. This study therefore suggests perhaps if the study subjects had responded promptly, the right advice or treatment would have been given.

4.3.2.2 Number of respondents who received treatment

Figure 4 show the number of the study subjects who received treatment

Further to availability of services, figure 4 above shows that 141 (94%) of the study subjects received the recommended treatment, while 9 (6.0%) did not receive due to various reasons.

Among those who did not receive treatment, 5 (55.6%) cited lack of treatment materials and 1 (11.1%) said they lacked money. The remaining 3 (33.3%) cited mixed reasons such as lack of time to visit the clinic and money. This was an indication that oral health services were provided to those who visited the facility as 94% were treated
4.3.3 Accessibility to oral health services

Table 8 shows the distance to the nearest oral health facility

<table>
<thead>
<tr>
<th>Distance</th>
<th>Number of study subjects</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-11 km away</td>
<td>363</td>
<td>92.8%</td>
</tr>
<tr>
<td>12-25 km away</td>
<td>25</td>
<td>6.4%</td>
</tr>
<tr>
<td>Did not indicate</td>
<td>3</td>
<td>0.8%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>391</td>
<td>100%</td>
</tr>
</tbody>
</table>

N = 391

The study determined distance from the respondent’s area of residence to the nearest oral health facility. Table 8 above shows that 363 (92.8%) of the study subjects lived within 11 km from the nearest oral health facility. The remaining 25 (6.4%) lived within 25 km away. Those who did not indicate the distance were 3 (0.8%). The results show that the majority of the respondents lived within 11 km from the nearest oral health facility. A tarmac road and a network of feeder earth roads access the area. There is public transport serving both short and long distances.
4.4 Existence of alternative treatment in the community

Figure 5 shows where the respondents went to seek treatment

With respect to where the respondents went to seek oral health services, the following results were obtained. Out of the total number of 391 respondents interviewed, 351 (89.8%) sought medical treatment, while 37 (9.5%) visited traditional healers. Only 3 (0.7%) of the respondents did not answer this question.

Among those who visited a traditional healer, (35.3%) cited lack of finances to seek medical treatment in the hospital, and 10 (27%) said relatives and friends advised them. This figure suggests majority (89.8%) of the study subjects sought medical care. However, the element of lack of finances and advice by relatives cannot be ignored, as they are important factors.
4.5 Access to oral health education (OHE)

Figure 6 represents the number of respondents who had access to (OHE)

Access to oral health education knowledge, which is mainly preventive, was determined and the following results were obtained. Figure 6 above shows that, 272 (69.6%) of the respondents had never received oral health education while 119 (30.4%) had received OHE from various sources. The results therefore show majority of the respondents (69.6%) had no oral health education.
4.5.1 Source of oral health education (OHE)

Figure 7 represents source of oral health education

For those who had received OHE, 74.8% was from teachers in school, 17.6% by health workers during hospital visits and in Barazas by health workers, 1.6% from hospital and schools. Others 2.5% from relatives and friends. Those who did not respond 3.5%. These findings indicate that teachers (74.8%) were the main source of oral health education in the study community. Only (17.6%) received OHE from health workers. This shows health workers played a minimal role in OHE information dissemination.
4.5.2 Oral health education primary health messages

Figure 8 shows the percentage of the respondents in relation to the number of Oral health prime messages that they knew

The study sought to find the number of oral health messages that the respondents knew in respect to the three OHE prime messages. This is shown in (figure 8). In oral health, there are three important attributes referred to as prime messages.

These include:

(1) Regular brushing of teeth at least twice in a day, i.e. morning and before bed.

(2) Visits to a dentist at least once or twice in a year for checkup.

(3) Avoidance of sugary diet between meals.
The study revealed that, among the 119 study subjects who had OHE, 45 (37.8%) knew one message, 49 (41.2%) knew two and 25 (21.0%) knew the three prime OHE messages. The results suggest majority of the respondents did not have adequate knowledge on OHE since only (21%) knew the three prime oral health messages.

4.5.3 Reasons for not receiving oral health education

Figure 9 shows reasons for not receiving oral health education

![Pie Chart](image.png)

For those who had not received OHE, this is shown in figure 9 above, where 93.1% said no one has ever gone to the community to teach OHE, while 19 (6.9%) said they have never been taught OHE even in hospital. This is an indication that the majority of the respondents did not have access to OHE due to lack of information dissemination in the community (93.1%).
4.5.4 Knowledge on whether dental check-up was necessary

Fig. 10 Respondents knowledge on whether dental checkup was necessary

Interestingly when respondents were asked on whether dental check up was necessary in figure 10 above, 284 (72.6%) of the respondents gave a positive answer, while 94 (24.04%) said it was not, 13(3.32%) did not respond to this question.
4.6 Cross-tabulations

In order to determine Oral health education and practices, Cross-tabulations of various variables was done. This was meant to establish relationships between variables so as to answer the research questions, attain the objective goals and establish the extend to which hypotheses of the study has been confirmed. The variables considered were age and gender, oral hygiene practices, accessibility to services, availability of services, knowledge on oral health education (independent variables) and visits to a dentist as the (dependent variable).

4.6.1 Cross-tabulations on visits to a dentist and different variables

<table>
<thead>
<tr>
<th>Number of visits in a year</th>
<th>Distance to the nearest oral health facility</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less than 6 Km</td>
<td>More than 6 Km</td>
</tr>
<tr>
<td>At least once</td>
<td>6 (12%)</td>
<td>14 (14%)</td>
</tr>
<tr>
<td>Visits due to need</td>
<td>42 (85.7%)</td>
<td>86 (86%)</td>
</tr>
<tr>
<td>Did not respond</td>
<td>1 (2%)</td>
<td>1 (0.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>49 (100%)</td>
<td>101 (100%)</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 0.339, \text{df}=2, p=0.844 \]

Relationship between distance from the nearest oral health facility and frequency of visits by the respondents was determined. Table 9 above shows 12% of the respondents who lived less than 6km and 14% of those who lived more than 6km away visited atleast once. Majority of the respondents 42 (85%) who lived less than
6 km and 86 (86%) who lived more than 6km visited due to “need”. The results therefore indicate distance did not influence the number of times the respondents visited the nearest oral health facility. Frequency of visits was dictated by urgent health needs. There was therefore no significant statistical relationship between distance and the number of times one visited a dentist in a year $\chi^2=0.339$ df=2, p>0.05

4.6.2 Cross tabulations of oral hygiene practices and different variables

Table 10 Age group and frequency of tooth brushing

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>Once in a day</th>
<th>Twice in a day</th>
<th>Three times</th>
<th>Rare/never</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24 yrs</td>
<td>65 (34%)</td>
<td>59 (45%)</td>
<td>30 (46.9%)</td>
<td>0</td>
<td>154 (39%)</td>
</tr>
<tr>
<td>25-34 yrs</td>
<td>46 (24%)</td>
<td>37 (28%)</td>
<td>12 (18.75%)</td>
<td>0</td>
<td>95 (24%)</td>
</tr>
<tr>
<td>35-44 yrs</td>
<td>43 (22%)</td>
<td>20 (15%)</td>
<td>8 (12.5%)</td>
<td>0</td>
<td>71 (18%)</td>
</tr>
<tr>
<td>45-54 yrs</td>
<td>24 (12%)</td>
<td>10 (8%)</td>
<td>9 (14%)</td>
<td>1 (33.3%)</td>
<td>45 (11%)</td>
</tr>
<tr>
<td>55 years and above</td>
<td>16 (8%)</td>
<td>4 (3.0%)</td>
<td>5 (7.8%)</td>
<td>2 (66.7%)</td>
<td>27 (7%)</td>
</tr>
<tr>
<td>Total</td>
<td>194 (100%)</td>
<td>130 (100%)</td>
<td>64 (100%)</td>
<td>3 (100%)</td>
<td>391 (100%)</td>
</tr>
</tbody>
</table>

$\chi^2=56.540$, df=20, p=0.0001

Factors that may influence oral health hygiene practices were investigated. In table 10 above, frequency of tooth brushing among the age groups was investigated and the following results were obtained. It was observed that all the respondents in the 15 – 24 year age groups brushed teeth regularly. Further the majority in this age group
brushed teeth more than once 59 (45.4%) twice and, (46.9%) thrice, which was higher, compared to all the other age groups. The respondents who never brushed teeth at all 3(0.8%) were found in the 45 years and above age groups. This therefore shows difference in tooth-brushing habits among age groups was statistically significant $\chi^2=56.540$, df=20, p<0.05

Tables 11 Gender of respondents in relation to frequency of tooth brushing

<table>
<thead>
<tr>
<th>Sex of Respondents</th>
<th>How often one brushes teeth</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>once</td>
<td>Twice</td>
</tr>
<tr>
<td>Female</td>
<td>97(50%)</td>
<td>79(60.7%)</td>
</tr>
<tr>
<td>Male</td>
<td>97(50%)</td>
<td>51(39.2%)</td>
</tr>
<tr>
<td>Total</td>
<td>194(100%)</td>
<td>130(100%)</td>
</tr>
</tbody>
</table>

$\chi^2 = 13.220$, df = 5, p = 0.021

Further to factors that may influence oral hygiene practices, frequency of tooth brushing among gender was investigated. Table 11 above shows (50%) of males and female brushed teeth once in a day. However there was a difference observed among those who brushed teeth more than once as the females (60.7%) brushed twice and (60.9%) brushed thrice respectively compared to the males (39.2%) and (39.2%) twice and thrice. The findings therefore show that difference in tooth brushing habits among males and females is statistically significant $\chi^2 = 13.220$, df=5, p<0.05. Which meant that females brushed teeth more regularly than males.
Tables 12 Frequency of tooth brushing in relation to visits to a dentist

<table>
<thead>
<tr>
<th>How often one brushes his/her/teeth</th>
<th>Whether one has ever visited a dentist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Once in a day</td>
<td>123 (51%)</td>
<td>71 (47.3%)</td>
</tr>
<tr>
<td>Twice in a day</td>
<td>75 (31%)</td>
<td>55 (36.7%)</td>
</tr>
<tr>
<td>Three times in a day</td>
<td>41 (17%)</td>
<td>23 (22%)</td>
</tr>
<tr>
<td>Rare/Never</td>
<td>2 (0.8%)</td>
<td>1 (0.7%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>241(100%)</td>
<td>150(100%)</td>
</tr>
</tbody>
</table>

N = 391

\[ \chi^2 = 2.108, \quad df = 5, \quad p = 0.834. \]

Data collected from respondents was analyzed to determine whether there was any relationship between visits to a dentist and frequency of tooth brushing. As shown in (table 12), it was found that there was no significant relationship found on number of times one brushes his/her teeth and visits to a dentists. \[ X^2 = 2.108, \quad df = 5, \quad p > 0.05. \] This means personal tooth brushing habits were not related to utilization of oral health services.
4.6.3 Cross-tabulation of Oral health education (OHE) and different variables

Table 13 Oral health education compared to age groups

<table>
<thead>
<tr>
<th>Oral Health Education</th>
<th>Age groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15-24 yrs</td>
<td>25-34 yrs</td>
</tr>
<tr>
<td>Fair</td>
<td>20 (44%)</td>
<td>12 (27%)</td>
</tr>
<tr>
<td></td>
<td>Fairly good</td>
<td>25 (51%)</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>14 (58%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>59 (50%)</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 11.803, \text{df}=11.907, p=0.16 \]

The number of oral health messages in each age group was determined. The results show the 3 oral health messages 24 (20.8%) were least known compared to the other categories, 1 message 45 (38.1%) and 2 messages 49 (41.5%) as can be seen from table 14. There was therefore no significant relationship between age and OHE knowledge \( \chi^2 = 3.97, \text{df} = 6, p> 0.05 \). The results therefore show level of OHE awareness was inadequate or poor among all age groups.
4.6.3 Cross-tabulation of Oral health education (OHE) and different variables

Table 13 Oral health education compared to age groups

<table>
<thead>
<tr>
<th>Oral Health Education (OHE)</th>
<th>Age groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15-24 yrs</td>
<td>25-34 yrs</td>
</tr>
<tr>
<td>Fair (1 message)</td>
<td>20 (44%)</td>
<td>12 (27%)</td>
</tr>
<tr>
<td>Fairly good (2 messages)</td>
<td>25 (51%)</td>
<td>14 (29%)</td>
</tr>
<tr>
<td>Good (3 messages)</td>
<td>14 (58%)</td>
<td>5 (21%)</td>
</tr>
<tr>
<td>Total</td>
<td>59 (50%)</td>
<td>31 (26.3%)</td>
</tr>
</tbody>
</table>

The number of oral health messages in each age group was determined. The results show the 3 oral health messages 24 (20.8%) were least known compared to the other categories, 1 message 45 (38.1%) and 2 messages 49 (41.5%) as can be seen from table 14. There was therefore no significant relationship between age and OHE knowledge $\chi^2 = 3.97$, df = 6, p > 0.05. The results therefore show level of OHE awareness was inadequate or poor among all age groups.
Table 14 Oral health education (OHE) in relation to whether one has ever visited a dentist

<table>
<thead>
<tr>
<th>Oral health education (OHE)</th>
<th>Whether one has ever visited a dentist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No (38.8%)</td>
<td>Yes (37.3%)</td>
</tr>
<tr>
<td>Fair 1 message</td>
<td>26(38.8%)</td>
<td>19(37.3%)</td>
</tr>
<tr>
<td>Fairly good 2 Messages</td>
<td>28(41.8%)</td>
<td>21(41.2%)</td>
</tr>
<tr>
<td>Good 3 Messages</td>
<td>13(19.4%)</td>
<td>11(21.5%)</td>
</tr>
<tr>
<td>Did not indicate</td>
<td></td>
<td>1(0.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>67 (56.7%)</td>
<td>51 (43.2%)</td>
</tr>
</tbody>
</table>

N=119

\[ \chi^2 = 0.088, \text{df} = 2, \text{p} = 0.957 \]

In order to determine whether there was a relationship between visits to a dentist and the respondent’s knowledge on oral health education, data was further analysed and the following results obtained. Among the 119 respondents who had OHE, only 51 (43.2%) visited a dentist and 67 (56.7%) did not. Further the three OHE messages in both groups were the least known (19.4%) for those who did not visit and (21.5%) for those who visited.

This study therefore finds no significant statistical relationship between OHE and visits to a dentist \( \chi^2 = 0.088, \text{df}=2, \text{p}> 0.05 \). These results suggest knowledge alone may not contribute to proper utilization of services. There needs to be other factors combined to achieve this goal.
4.7: DISCUSSION

4.7.1 Gender and age of respondents

Out of 391 respondents recruited in this study, female respondents were found to be more 218 (55.8%) than males 173 (44.2%). The youngest group 15-25 years (39.39%) were more represented followed by 25-34 years (24.3%) and 35-44 years (18.16%) respectively. The older groups 45-54 years (11.25%) and 55 years (6.91%) and above were least represented. The bigger youth numbers could be attributed to the fact that in Kenya, most of the young people stay at home after completion of school due to lack of opportunities and therefore were present during the collection of data. Another factor could be that the study was conducted mainly in the month of April when schools were closed and most young people were on holiday, giving a true picture of the population representation.

4.7.2 Oral hygiene practices

This study revealed that 99.2% of the respondents reported that they brushed their teeth regularly while a small number (0.8%) never brushed at all. Tooth brushing is the principal means by which most individuals control plaque that cause tooth decay (Nzioka et al 1993). To ensure good oral health, plaque control has to be promoted and practiced. A study by Lembariti in (2001a) show that plaque control ranked number one among preventive measures against oral diseases. This is so because it is directed towards micro flora that colonizes the tooth surfaces hence causing tooth decay.

In this study most of the respondents who brushed teeth mainly used industrial toothbrush and paste (70.1%), chewing stick and paste (6.9%).
The remaining participants (9.9%) used industrial toothbrush and salt (3.8%), and (9.6%) used industrial toothbrush and chewing stick alone respectively. This established that (77.5%) of the respondents used industrial toothbrush, chewing stick and paste that are considered as the correct devices in tooth brushing.

The use of chewing stick has been shown to be as effective as an industrial or conventional tooth brush in a study among adult rural population in Tanzania (Sarita, 1992). Use of toothpaste has traditionally been to remove stains, make teeth whiter, enhance fresh breath and good taste in the mouth. Further it has ingredients that prevent tooth decay and subsequent diseases such as periodontal disease (Lembariti, 2001a).

In this study, 49.4% of the respondents were found to brush teeth once in a day. The rest, a slight majority 49.6% brushed twice and thrice at various times. Females were found to brush their teeth more often than the males. It was observed 60.8% of females and 32.9% of males brushed more than once a day. This shows females observed better oral hygiene practices than males.

Among age groups the youngest group 15-24 years 45.9% brushed their teeth more than once a day, which was not observed among the other age groups.

Studies show colonization of tooth surfaces by bacteria as the key ecological factor in development of oral diseases (Lembariti, 2001 a). Ideal tooth brushing requires one to brush in the morning, after lunch and before bed. However effective, brushing of teeth twice in the morning and before bed is highly recommended and convenient. This is
necessary in removal of food debris (plaque) in between teeth that cause tooth decay and to maintain fresh breath.

Tooth brushing habits, use of toothbrush /chewing stick and toothpaste were reportedly high in this study. However to achieve good oral hygiene, other factors have to be considered and practiced. This includes clinical assessment by specialists to ensure effectiveness of tooth brushing in plaque removal, which is a factor in prevention of oral diseases.

Researches the world over (Lembariti, 2001) indicate abundance of plague that cause tooth decay in the communities despite the fact that, people clean their teeth frequently using either factory made tooth brush, chewing stick, ash, or charcoal. This has been attributed to people’s use of toothbrushes, which are defective such as flattened bristles or hard fibre bushes. Further, factors such as inappropriate knowledge, poor motivation and compliance with oral hygiene instructions may compromise the quality of plaque removal. Adequate and effective toothbrush, use of correct tooth brushing techniques with toothpaste are highly recommended by dentists. This should be combined with regular dental checkup and adherence to proper diet practices (Nzioka et al 1993; Lembariti, 2001).

On cross tabulation to check for relationship between the respondent’s tooth brushing habits and visits to a dentist, there was no significant statistical relationship \( \chi^2=2.1.8, \text{df}=5, P=0.834 \). This meant frequency of tooth brushing by the respondents was not related to number of visits one made to the dentist.
In comparison, a related study to assess periodontal status and oral hygiene practices among a middle-aged population in Tanzania, (Mumghamba, 2003) found 95% of the respondents brushed teeth regularly. Frequency of brushing (36.8%) once, (47%) twice and (10.7%) thrice. Periodontal disease status in the population was found to be very poor 100% and did not match the brushing practices. This could perhaps serve as an example of existence of oral diseases despite the fact that people report to brush teeth regularly. It could perhaps be the existing situation among the study community.

There is need therefore for more invasive investigations that should include clinical examinations by specialists to assess the effectiveness of oral hygiene practices in regard to tooth brushing habits and diagnosis of diseases among the study community.

4.7.3 Utilization of oral health services

4.7.3.1 Visits to a dentist

This study revealed that 150 (38.4%) respondents had visited a dentist while 241 (61.6%) had never. The study therefore revealed that the respondents did not observe basic oral health care practices, as a majority (61.6%) had never been to an oral health facility for services. This could have been contributed by lack of awareness of the services provided by dentists or perhaps the respondents ignored.

The study also revealed that the duration of visits was delayed and occurred mainly above 1 year 74.7% (table 5). For proper oral health care, one is required to visit a dentist once or twice in a year for checkup, advice on proper oral hygiene practices, diet and early detection of diseases (Mulli, 2002; Owino, 1996). The findings
therefore show the respondents did not observe basic oral health care, which could risk them to oral diseases.

A Study in Scotland (Kay et al, 1986) where dental extractions are relatively common revealed irregular attendance to the dentist as a contributor to higher morbidity rates. This may therefore explain why regular visits to a dentist for checkup, advice on diet and good oral hygiene practices may be the best way to prevent oral diseases.

This study further established that “need” or when the respondents had oral health problems necessitated frequency of visits to a dentist. This was observed among 85.3% of the respondents (figure 2). Only 4.6% (table 6) of the respondents reported for checkup. This further strengthens the earlier argument that the respondents may not have been aware of the correct practices or they ignored basic oral health care practices.

Elsewhere in Africa Ghana, (Bruce et al, 2001) reported all extraction cases 76.9% were presented as emergencies associated with either pain or facial swelling. This could be compared to the urgent “need” in this study. The report further indicated that the utility value that Ghanaians put on dental problems to be minimal and that patient had rather assume the sick role and only be driven out for treatment by unbearable pain. The findings in this study are perhaps a reflection of the general population’s attitude towards dental treatment as in previous findings. This could be attributed to lack of oral health education knowledge (OHE) awareness, which emphasizes the need to prevent the diseases rather than treatment.
4.7.3.2 Oral health problems commonly encountered and availability of services

It was further observed that most of the respondents 94.7% who visited the oral health facility had various oral health problems. Painful tooth (52%) was the major complaint presented to the dentist by the study subjects, followed by a hole on the tooth (28%). The other problems included painful tooth and injuries, swollen jaw, bleeding gums and teeth. These were severe signs and symptoms that made the respondents not to wait any longer as they were pressing needs. These findings are a pointer that oral diseases do exist among community members and need early diagnosis and treatment. Investigations to establish data on prevalence on the specific oral diseases within the study community will assist in formulation of relevant and effective preventive interventions.

This study further revealed that by the time the respondents went to see a dentist, the conditions were advanced and severe making the rescue situation too late. Early diagnosis and treatment would have prevented the advancement and severity of the signs and symptoms. Studies on complaints of patients seeking periodontal treatment (Mulli, 2002) indicated that 36.6% of the patients were not aware of the disease presence until referred by clinicians to seek dental services. This means that though only 150 of the respondents in this study presented themselves to the dentist, many more could be suffering from oral diseases that are undiagnosed and especially in early stages before severe signs and symptoms were manifest.

Researches in Africa observed that about 90% of oral diseases are untreated (WHO, 1999). Mulli (2002) reported that most of oral diseases develop gradually and can be
detected early to prevent tooth extraction with associated difficulties of mastication, aesthetics and general discomfort.

This therefore calls for awareness creation with regard to early diagnosis and referral to specialists. With shortage of trained manpower in Kenya (Lesan, 2000), there is need to increase oral health workforce. This is so because most of the trained personnel work in urban areas which leaves out the majority rural population (MOH, 1999). This could be achieved through training of other health workers especially those working in rural areas since they are in contact with the majority of the rural population.

In this study among the 272 (69.6%) respondents who never received OHE, a majority 93.1% was never taught OHE in the community or in hospital 6.9%. Further teachers in schools 74.8% were the main source of oral health education. The findings show there is poor dissemination of OHE in the community.

This study further revealed among the 241 respondents who never visited the dentist, 83.8% said they never had a dental problem or did not appreciate the need to see a dentist unless they had a problem. This could perhaps have been attributed to lack of OHE awareness as only 30.4% of the respondents had access. This could mean they might not have been aware of the services provided by the dentist. A sizeable number (10.4%) however cited cost and (2.1%) fear of dental procedures. These are factors, which cannot be ignored.

In a study on reasons underlying failure to seek dental services among University students (Wakianga et al, 1996) revealed a significant proportion (35%) of the
participants were found not to appreciate the need to see a dentist unless they had a dental problem. Further it was observed even those with a problem gave one reason or the other for not going to see a dentist. This was despite the express knowledge of oral diseases and treatment modalities among the students. Further the report showed cost was a factor as a sizeable number of the participants 48% and 44% said dental treatment was expensive or had no money respectively.

Concerning the availability of services, the study observed that 94% of the subjects who visited the dentist received the treatment they were advised to receive. Only (6%) of the respondents did not receive treatment due to various reasons. Among them, lack of materials at the health facility, money and time were mentioned as some of the reasons that made respondents not to get treatment.

Oral health services were provided at the nearest oral health facility such as tooth extraction, filling, cleaning of teeth, medication and advice on oral hygiene. This was observed among the 150 study subjects who were seen by the dentist with various dental problems. Most of them 82.9% were treated by tooth extraction. Further, it was noted that treatment depended on the diagnosis made on arrival at the oral health facility.

These findings agree with oral health records within Machakos Hospital (MOH, 2004) which showed about 80% of patients who visited the facility between year 2003 and 2004 had their teeth removed. Further, these observations agree more or less with studies elsewhere in Africa (Bruce et al, 2001) where, in Ghana’s major hospital Korle Bu, 76.6% of dental treatment was by tooth extractions.
This percentage, (82.9%) of tooth extractions among the study subjects is a pointer to late diagnosis, delayed treatment and high tooth mortality among the study community. It is perhaps a reflection of the existing oral health situation among other Kenyan communities.

There is need for the MOH to take urgent measures to contain the situation. Community based studies to establish prevalence and the magnitude of the disease burden in each of the communities in Kenya will be necessary. This will assist to establish relevant data and to define effective health education messages in formulation of policies and intervention programmes. The interventions should mainly focus on proper utilization or access to simple but effective preventive services.

In Kenya, earlier studies (Kaimenyi et al 1993) observed that the main reason for visiting a dentist by the study population (63%) was to have a tooth extraction. This has been echoed severally by researchers in Kenya and in other African countries with minimal action taken to improve the situation. The findings raised more questions as to whether other form of dental treatments cannot be carried out to prevent tooth removal. Such treatment could include root canal treatment. This is an area that needs to be explored and it is a challenge to the dental practitioners to restore good oral health to Kenyans.

Further there is need for the policy makers and MOH in particular to take the services nearer to the people and to provide adequate trained personnel. The personnel should
particularly disseminate OHE in the community, which is mainly preventive, and for early diagnosis of oral diseases.

4.7.3.3 Accessibility to oral health services

Poor accessibility to oral health services has been blamed as one of the obstacles to peoples' acquisition of better oral health care in Kenya (Lesan, 2000). This have been attributed to placement of oral health facilities far away from the majority of the rural population and poor road infrastructure (MOH, 1999).

As per the respondents opinion on distance estimate, 363 (92.8%) of the respondents lived within 11km from the nearest oral health facility and the rest lived upto 25km away. The study area, Mumbuni and Mutituni locations are located on the outskirts of Machakos town. There are established road network, both tarmac and earth roads that serve the area. However, further into the interior from about 12- 25km the road infrastructure is bad due to poor maintenance and terrain. This usually causes travel difficulties especially during rain seasons. There is public transport serving both short and longer distances. In consideration of the factors that may contribute to poor accessibility to the nearest oral health facility, distance was not mentioned. Cost was mentioned by only (10.4%) of the 241 respondents who did not visit the dentist.

The placement of the oral health facility could generally be described as accessible only to those with money for transport and those without could walk. However, in the above
scenario, out of a total of the 391 study subjects, only a small proportion 150 (38.4%) were found to have visited the oral health facility. This therefore shows other factors could have played a major role.

On cross tabulation to check for relationship between distance from area of residence and visits to a dentist, there was no statistical relationship found $p=0.844$. This shows that distance from area of residence to the facility did not influence the respondents to visit the dentist.

4.7.4 Existence of alternative treatment in the community

Among the 391 respondents interviewed in this study (89.8%) were reported to seek medical treatment while (9.5%) went to a traditional healer.

Among those who went to seek traditional treatment, the reasons given were lack of finances (35.3%) and influence from relatives and friends (27%). Although these findings suggest majority (89.8%) of the study subjects went for medical treatment in hospital, the role of finances and influence from relatives cannot be under stated or ignored.

4.7.5 Access to oral health education (OHE)

A major observation was made in this study when the respondents were asked to state whether they knew the messages taught in oral health education. This study revealed only 119 (30.4%) of the 391 study subjects interviewed had oral health education, while 272 (69.6%) had never received the messages.
Concerning the source of OHE, it was found that teachers in schools (74.8%) were the main source while only (17.6%) of the respondents received OHE from health workers both in hospital and during barazas. The results show health workers played a minimal role in dissemination of OHE in the study community.

Further, on the reasons that made the respondents not to received OHE, (93.1%) said no one has ever gone to the community to teach oral health education and 6.9% said they have not been taught even in hospitals. The results showed minimal or poor OHE dissemination in the study community.

The findings that teachers are the main source of oral health education has been reported elsewhere in studies (Masalu et al, 2002), where teachers and mass media were found to be the main source of OHE information in Tanzania. A strategy involving teachers and nurses was adopted to teach OHE due to scarce number of dental professionals. The findings that, mass media was a major source of OHE dissemination differs from this study since it was not mentioned. This brings out an important point that mass media can play an active role in OHE information dissemination if the public is targeted. A combination of mass media, and deployment of an extra oral health trained workforce or extension of workforce by MOH to work in the community would be of great importance if implemented in Kenya’s oral health delivery system so as to reach the masses. This should target dissemination of OHE which is clearly poor in the community as found earlier among 93.1% of those who never received OHE.

A community survey in Hlabisa south Africa (Renu et al, 2000) where prevalence of dental caries among adult population was found to be high 80%, 76% of the
respondents were found not to have OHE. This may help to emphasize the importance of teaching OHE and the need for a community survey to establish oral disease status in the study community.

The role-played by teachers in dissemination of OHE need to be strengthened especially at primary level where children get information readily and therefore build a strong base in oral health education. This will be reflected later in adulthood.

Further analysis of data was done inorder to identify the type of oral health education messages the study subjects knew. Information on OHE required one to mention the three primes messages that is; regular visits to a dentist for checkup, brushing of teeth at least twice, in the morning and before bed and reduction of sugar in diet. This is so because leaving out any of the information amounts to poor knowledge and will result to poor practices that will predispose the respondents to oral diseases.

This study established that out of the 119 people who were reported to have had oral health education, only (21%) had the three prime messages, (41.2%) had two, (37.8%) had one message in that order. This clearly shows that oral health knowledge in the community is inadequate or can be described as poor.

Interestingly though, when respondents were asked whether dental check up was necessary, 72.6% of the 391 study subjects responded positively and, only (24%) said it was not necessary, (3.3%) did not respond. These findings could be attributed to the general public beliefs, that to see a doctor is good for check up though only few a practice this, and only when they have health problems. Similarly, most of the study,
subjects gave a positive answer, but as earlier found in this study, they only went to see a dentist when they had oral health problems (85.3%).

On cross tabulation to check for relationship of OHE among age groups, there was no statistical significant relationship found (p=0.16). This means no specific age group could be singled out as more knowledgeable than the others. Also as observed earlier, oral health education is not being taught in the community.

Further, the study revealed that among the 119 respondents, who had OHE, only 51 of them visited a dentist. Out of these only a small proportion of the respondents 11 (21.56%) had the three OHE messages with the rest (41.18%) having two and (37.3%) one message respectively. These findings point to poor OHE information that may have contributed to poor utilization of oral health services.

On cross tabulation on knowledge on oral health education in relation to whether one ever visited a dentist, there was no statistical relationship observed P= 0.957. The results could be due to inadequate knowledge among the respondents as only 21% had the three OHE messages.

This therefore calls for the dental professionals to device ways to motivate and to educate the community on the benefits of good oral health practices and the need to adhere to them so as to prevent poor oral and general health respectively.

Further health professionals and dentists in particular need to define strategies on plague control and ensure good oral hygiene practices. This is because health professionals have the knowledge to assist in promotion of appropriate concepts and
policies through dissemination of OHE. A clear understanding of the relationship between plaque and disease may promote a better personal motivation to adequate hygiene. To achieve this, the professionals need to reach out to individuals and the populations at large. Manufactures of tooth cleaning devices need to be involved in provision of affordable cleaning devices in the market and in oral health education promotion through honest commercial adverts.
CHAPTER FIVE. CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE RESEARCH WORK

5.1 Conclusions

(a) Majority of the study subjects (99.2%) reported to brush teeth regularly mainly using toothbrush / chewing sticks and toothpaste (77.5%) which are recommended as the correct devices in tooth brushing.

(b) Females observed better oral hygiene than males as 60.8% of females brushed their teeth more often, that is more than once compared to the males 39.2%. Nearly 50% of the respondents brushed teeth once in a day, which could predispose the respondents to oral diseases.

(c) Majority of the respondents (61.6%) had never visited an oral health facility to see a dentist, and among those who visited, (83.8%) believed one should only visit when they had oral health problems.

(d) The main reason of visits to an oral health facility by the study subjects (85.3%) was due to "need" that is, when they had oral health problems that required urgent attention. Few of the respondents (4.6%) reported for check up which is mainly preventive.

(e) Most of the respondents (94.7%) went to see the dentist when the disease was advanced and severe, generally with late signs and symptoms as was in painful tooth (52%) which was the major complaint presented at the oral health facility. The rest of the conditions were severe such as a hole on tooth and other combined problems such as painful tooth, swollen jaw, and injuries, bleeding gums, which forced the respondents to seek remedy. Progression of these diseases should have been detected early with dental check up and treatment instituted to prevent tooth loss.
(f) Diagnosis and treatment was given in accordance with the state at which the respondents presented themselves to the dentist, most of them were treated mainly by tooth extraction (82.9%).

(g) Oral health services were provided at the oral health facility as 94% of the respondents received the treatment they were advised. Only 6.0% did not receive.

(h) The distance from area of residence and visits to a dentist, was not statistically significant (p=0.844) as distance was not found to influence the number of visits the respondents made to the dentist. Visits to the dentist were dictated by urgent oral health needs.

(i) Most of the study subjects (89.6%) reported to seek medical treatment in oral health facilities with very few (9.5%) seeking traditional healing, mainly due to lack of finances, advice from friend and relatives.

(j) Only (30.4%) of the respondents had access to oral health education knowledge and the majority (69.6%) did not have. Among those without the knowledge, 93% have never been taught OHE in the community.

(k) Teachers (74.8%) were identified as the major source of OHE with health workers playing a minor role.
5.2 Recommendations

(1) There is need for the MOH to educate the community on oral health education and in particular device strategies to ensure good oral hygiene practices.

(2) Knowledge on OHE alone will not contribute to better oral health service utilization and practices. It should be designed to motivate the public and aim at developing commitment, value, and understanding in self-care therefore changing public attitude towards oral health service utilization.

(3) A multi-sectoral approach involving the professionals, manufacturers of tooth cleaning devices, the media and schools needs to be adopted in order to disseminate OHE information. This could be achieved through the following;

(i) The MOH needs to target and train its workforce especially those working in the rural areas to provide basic oral health services to the community. This should mainly aim at early prevention, diagnosis, and treatment of minor ailments and referral to specialists.

(ii) Teachers need to be trained as resource persons in dissemination of OHE information to pupils who get information readily. Further OHE programs to be included in the school curriculum. Trained health workers to provide actual demonstrations on proper maintenance of oral hygiene (School health programmes) should accompany them. This will build a strong base in childhood and later in adulthood.

(iii) Oral health professionals need to address the issue of tooth removal by doing other procedures such as root canal treatment to preserve teeth. These should be geared towards reduction of tooth mortality and educate the public on benefits of good oral health and teeth.
(iv) The media should play an active role in oral health education through honest public relations, commercial adverts through the radio, television, electronic media and other forms in dissemination of OHE. Professionals geared towards disease prevention can also provide this through live coverage on oral hygiene practice’s demonstrations. This will aim at wider education coverage in the community.

(4) There is need for the Government through the MOH to increase funding to programs linked to oral health such as mobile clinics or outreach as part of wider community coverage and more especially in rural areas with accessibility hindrances.

5.3 Suggestions for Future research

Further investigations should be carried out in the following areas;

1. Operational research to evaluate, strengthen and accelerate integration of oral health in primary Health Care programs especially in early childhood development initiatives in primary schools in order to build a strong foundation of OHE in childhood.

2. Conduct research with clinical examination in order to determine prevalence of specific oral diseases afflicting each community in Kenya. This will aid in development of meaningful interventions and will shed light on the magnitude of the disease burden.

3. Research is needed to explore the possibility to implement oral health care through multidisciplinary approaches between private and public organizations. This will forge a united front, bring in resources and knowledge to improve the infrastructure and professionalism in the fight against oral diseases.


WHA Wold (Health Assembly) (1994). Resolution. Afri \ RC 30\ R4 1980; Afri \ RC44\ R13


Appendix I

SURVEY QUESTIONNAIRE

DENTAL HEALTH EDUCATION AND PRACTICES AMONG COMMUNITY MEMBERS IN CENTRAL DIVISION, MACHAKOS DISTRICT, KENYA.

The information provided shall not be divulged to any other person and shall be used for the purpose of this study

Instructions

- Please do not indicate your name.
- Tick the appropriate option.
- Fill the blank spaces if necessary.
- Ask where you do not understand.

Some of the questions may have more than one answer

PART A

Bio-Data

Age (years) __________

Sex M ( ) F ( )

Oral hygiene practices

1) How often do you brush your teeth?
   a) Once in a day ( )
   b) Twice in a day ( )
   c) Three times in a day ( )
   d) Four times in a day ( )
Any other, specify

2) What do you use for brushing your teeth?
   a) Tooth brush alone
      ( )
   b) Tooth brush and tooth paste
      ( )
   c) Chewing stick and toothpaste
      ( )
   d) Chewing stick and salt
      ( )
   e) Chewing stick alone
      ( )
   f) Others specify

3) When do you brush your teeth?
   a) In the morning alone
      ( )
   b) Before bed
      ( )
   c) Morning and after lunch
      ( )
   d) Morning and before bed
      ( )
   f) Any other time specify

Utilization of oral health services

4) Have you ever visited a dentist?
   Yes ( )        No ( )

If YES answer question 5-10
If NO go to question 11
(5) How long ago did you visit a dentist?

(a) Less than a year ago 

(b) 1-2 years ago 

(c) 3-5 years ago 

(d) Never 

(e) Any other .................. 

(6) How many times in a year do you visit a dentist?

(a) Once 

(b) Two times 

(c) 4 Times 

(d) 5 times 

(e) When need arises 

7) Why did you visit the dentist?

(a) I had a painful tooth 

(b) I had a swollen jaw 

(c) My gums were bleeding 

(d) I had a hole on my tooth 

(e) My teeth, jaw were injured in an accident 

(f) For dental check up 

Other specify ........................................
Availability of oral health services

8) What treatment were you advised to receive?
(a) Extraction only
(b) Extraction and filling
(c) Filling
(d) Cleaning of teeth
(e) Given drugs and told to go home then come after sometime
(f) Root canal treatment
(g) Advised on oral hygiene and tooth brushing
Other Specify ..........................................................

9) Did you receive this treatment?
a) Yes ( )   (b) No ( )

If YES go to question 12
If NO go to question 10 then 11

(10) Why is it that you did not receive the treatment?
(a) I did not have the required amount of money
(b) I was told the machine was out of order
(c) I was told there were no materials
(d) I was told to wait but I had no time
(e) I was told the person to perform the procedure was not in
(f) I felt scared of the procedure
(g) I was given an appointment but I did not get time to come back
(h) I was helped by some one with another form of medication and I felt relieved

Others, specify .................................................................

**Alternatives in treatment of oral diseases**

11) How come you have never visited a dentist?

(a) I have never had any dental problem

(b) Dental treatment is expensive

(c) I usually have no free time and never granted permission at my work place

(d) I see no point of seeing a dentist unless I have a problem

e) Dental clinic is far away

f) Am usually scared of dental treatment because it is painful

g) Any other reasons that prevented you from seeking dental advise?

Specify .................................................................

(12) Have you ever visited a traditional doctor for dental treatment?

(a) Yes ( ) (b) No ( )

If YES answer question 13.

If NO go to question 14.

(13) If yes, what made you to visit him/ her?

(a) Advised by friends and family members

(b) Traditional doctors are cheaper

(c) Services by traditional doctors are better
(d) Traditional doctors are available at a walking distance  
(e) Traditional doctor offers services at any time.  
(f) You are never turned away by traditional doctors  
(g) Others specify .................................................................

**Accessibility to health services**

(14) How far is the nearest dental clinic from your place of residence?

(a) Less than 2 km away  
(b) 2-5 km.  
(c) 6-11 km  
(d) 12-20 km  
(e) More than 25 km

**Knowledge on oral health education**

(15) Is regular dental check up necessary?

(a) Yes ( )  (b) No ( )

16) Have you ever been given health education on oral hygiene?

(a) Yes ( )  (b) No ( )

17) If Yes where did you receive this education?

(a) When I visited the hospital.  
(b) While in school by my teachers.  
(c) In a baraza in the village by health workers.  
(d) In my local health center.
18) If no, why?

(a) No one has ever come in my village to give education on oral health. ( )

(b) When I visit hospital, I am given treatment for my ailment only. ( )

Others, specify ————————————————————————————————————————

19) If you were given health education, what were you told to do to maintain good oral health?

1. ———————————————————————————————————

2. ———————————————————————————————————

3. ———————————————————————————————————

Any other, specify ———————————————————
Appendix 2

MINISTRY OF SCIENCE & TECHNOLOGY

Telegrams: "SCIENCE TEC", Nairobi

Fax No.
Telephone No: 318581
When replying please quote

MOS & T 13/001/36/C 229/2

Agnes Kasusu Mutinda
Kenyatta University
P.O.Box 43844
NAIROBI

Dear Madam,

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ‘Factors influencing the utilization of oral health services among community members in Central Division, Machakos District Kenya’

I am pleased to inform you that you have been authorized to carry out research in Machakos District for a period ending 30th June 2006.

You are advised to report to the District Commissioner, the District Education Officer and the Medical Officer of Health, Machakos District before commencing your research project.

On completion of your research, you are expected to submit two copies of your research report to this office.

Yours faithfully,

B.O ADEWA
FOR: PERMANENT SECRETARY

Copy to: The District Commissioner – Machakos District