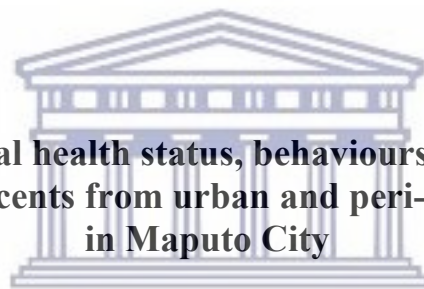# UNIVERSITY OF THE WESTERN CAPE
FACULTY OF DENTISTRY
DEPARTAMENT OF COMMUNITY ORAL HEALTH

MASTER OF SCIENCE IN DENTAL PUBLIC HEALTH

AMÁLIA ISSUFO MEPATIA

Self-assessment of oral health status, behaviours and oral health risk factors among adolescents from urban and peri-urban public schools in Maputo City

WESTERN CAPE
2018

Self-assessment of oral health status, behaviours and oral health risk factors among adolescents from urban and peri-urban public schools in Maputo City

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UNIVERSITY *of the*
WESTERN CAPE

A minithesis submitted in partial fulfillment of the requirements for the degree of Master of Science (Dental Public Health) in the Department of Community Oral Health, University of the Western Cape.

Supervisor: Professor Neil Myburgh

Date: 22nd November 2019

Final version

LIST OF ABBREVIATIONS

BMREC – Biomedical Science Research Ethics Committee

CI – Confidence Interval

CNBS – Comitê Nacional de Bioética para Saúde (National Bioethics Committee for Health)

CWT – Compensated Work Therapy

DOM – Domiciliary Care for Homeless Veteran

GOHAI – General Oral Health Assessment Index

HIV – Human Immunodeficiency Virus

INE – Instituto Nacional de Estatística (National Statistical Institute)

MISAU – Ministério da Saúde (Ministry of Health)

OMS – Organização Mundial de Saúde (World Health Organization)

SB – Saúde Bucal (Oral Health)

SP – Sao Paulo

SPSS - Statistical Software Package for Social Sciences

UWC – University of the Western Cape

WHO – World Health Organization

X^2 **-** Chi-square

KEYWORDS

Oral Health

Oral diseases

Oral Health risk factors

Self-assessment

Oral health behaviour

Oral health self-perception

Dental visits

Adolescents

Urban and peri-urban schools

Mozambique

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DECLARATION

.

I declare that *"Self-assessment of oral health status, behaviours and oral health risk factors among adolescents from urban and peri-urban public schools in Maputo City"* is my own work, that it has not been submitted before for any degree or examination in any other university, and that all sources I have used or quoted have been indicated and acknowledge as complete references.

Full name: Amália Issufo Mepatia   22nd November 2018

Signed: _____

DEDICATION

To my beloved father José Do Sameiro Mepatia who always instilled the value of keep studying and learning, you will always be my inspiration.

To my mother Hanifa Issufo Parsotamo Calachande Mepatia, for all her love and support you are my strength.

To my dear siblings Brigida and Alarico.

To my dear niece (Hanifa) and nephew (José Miguel).

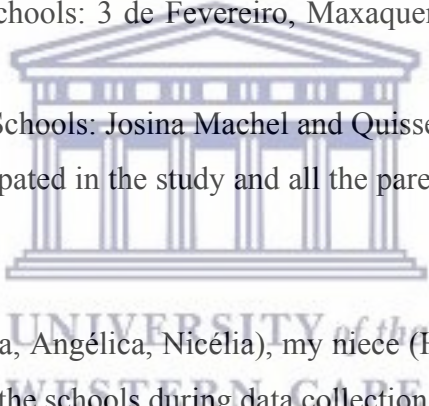*To my dear friends Graciete, Adelina and David*

Thank you all for your unconditional love and support.

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First of all I would like to express my deep gratitude to Professor Sudeshni Naidoo for the financial support.

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- ➢ Department of Education of Maputo City Municipality, the district directorates and the teachers, directors from the schools involved.
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To everyone who directly or indirectly contributed to this research project, this was an opportunity for acquiring academic and personal experience.
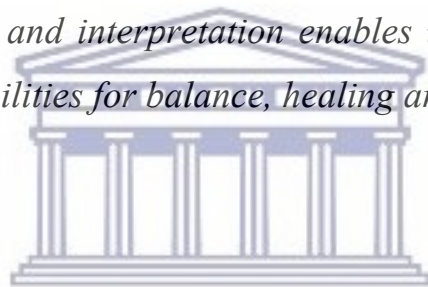

THANK YOU VERY MUCH.

ABSTRACT

A good oral health self-perception can contribute to improved knowledge of oral health self-care and practice as well as increase the proper use of dental care services. This study evaluated how adolescents from urban and peri-urban Maputo City assess their oral health status, behaviour and oral health risk factors. This is an analytic cross-sectional study, conducted in the urban and peri-urban schools of Maputo City involving adolescents in the age groups of 12 and 15-19 years old. The study was carried out in five schools, three Complete Primary schools and two Secondary schools from urban and peri-urban areas in Maputo City selected by convenience due to their geographic location. The size of the sample was 500 comprising 236 twelve year olds and 264 15-19 year olds. Data was collected using a self-completion questionnaire designed by the World Health Organization (WHO) and translated into Portuguese. The questionnaire included variables such as socio-demographic data (age, gender, location and parent or guardian level of education), self-assessment of oral health status and quality of life; self reported oral health behaviour and lifestyles, oral health risk factor knowledge (alcohol, tobacco and dietary), dental visits and daily impact of oral health. Chi-square for associations and a Spearman correlation tests were used to determine relationships between categorical data. All tests were assumed statistically significant at $p \leq 0.05$. The results showed that most of the adolescents classified their teeth (49.7%) and gum (38.2%) health as normal. There was no statistical difference between adolescents from urban and peri-urban schools (Spearman r_s (399) = 0,114, p =0,02). The majority (n=322; 65.2%) of the adolescents clean their teeth twice a day. There was no difference between school level (primary and secondary school) and frequency of teeth cleaning. Most of the adolescents use a toothbrush (97.8%) and toothpaste (93.5%) to clean their teeth and only 11.9% also use dental floss but 52.1% didn´t know if their toothpaste was fluoridated or not. Smoking was reported by less than 1% of the adolescents. The main reason for dental service utilization, (reported by 67.5%) was pain or problems with teeth, gums or mouth. There was an association between oral health status and problems experienced in daily life because of their teeth and mouth. There was no significant difference for oral health assessment, risk factors and behaviours, between adolescents from urban and peri-urban schools. Although some satisfactory results were found, the need to strengthen oral health promotion in schools is high, especially considering the causes for dental service utilization were mostly pain and trouble with teeth in this group.

"Reality is ultimately a selective act of perception and interpretation. A shift in our perception and interpretation enables us to break old habits and awaken new possibilities for balance, healing and transformation."
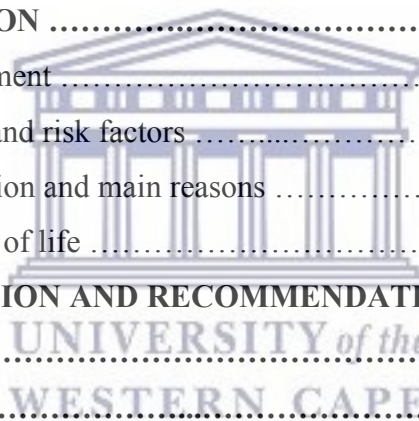
David Simon

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CHAPTER 1

1. INTRODUCTION

According to the World Health Organization, "*Oral Health is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing*" (WHO 2016). The exposure to pain, limitation with using the teeth, smiling and communication due to missing and poor appearance of teeth, have a considerable impact on people´s daily lives and well-being, resulting in reduced vivacity at school and at home, and causing the loss of millions of hours of work each year all over the world (Petersen *et al.* 2005).

Oral health diseases are qualified as a big health problem due to its prevalence and incidence in the different regions. They are very expensive to treat in the industrialized countries and almost not feasible in most developing countries (Petersen 2004). Oral diseases are associated with a number of oral health risk factors and determinants common to many other chronic diseases. Major risk factors include tobacco use, high sugar and alcohol consumption, as well as a broader determinants such as socio-economic status which influence oral and general health (FDI 2014).

Dental caries is still the most common and preventable oral disease and the main cause of pain and tooth loss. It is known that the main cause for dental caries and periodontal disease is bacterial plaque, therefore tooth brushing and dental flossing have an important role on oral health quality (Mapengo 2010).

Adolescence is a development stage characterized by different physical and psychic transformations involving a lot of internal conflicts, such as physical appearance self-acceptance including emotions generated by hormonal changes, identity crises, sexuality and other pressures that the proximity to the adult phase imposes. During this stage, lifestyle behaviours such as eating and hygiene, physical activity, tobacco consumption, alcoholic beverages or drugs, which may influence the morbidity pattern in adulthood habits, are being formed. However, it is a period in which increased learning related to positive attitudes and behaviours that, built in a decisive way, are important for the promotion of oral health (Zamboni *et al*. 2015). That is why it is important to study adolescents so that from their perspective and vision of the world we could understand how they express themselves and

search for help with the purpose of developing more effective measures, and planning of educational and preventive actions for this specific target group (Garbin *et al*. 2009).

Increased knowledge is generally the primary intention of oral health education and promotion programmes. Increased perception of proper oral health practice and the way these practices should function are the general outcomes. Some studies have demonstrated that a population´s perceptions and beliefs about disease may have a strong impact on their behaviours (Eisalhy *et al*. 2015). Literature shows that studying oral health perceptions could contribute important knowledge that can lead to improvement in the public oral health and proper usage of health care services (Okunseri *et al*. 2008).

Data on populations' oral health status and prevalence of risk factors are important for surveillance of disease patterns and understanding trends over time (WHO 2013). Additionally, data on dental health and behaviour in the population has a considerable relevance to the planning and evaluation of dental health services (Petersen 1983).

1.1. Purpose of the Study

Studies about oral health in Mozambique are scarce in the literature, which does not allow us to have the real panorama of oral health status in the country (Mapengo 2010). Some oral health actions are being made to promote oral health mainly with schoolchildren but the results are not being measured or monitored concerning its results or changes on school children's behaviours. There is a huge need to conduct research to obtain accurate information to develop strategies for oral health promotion and prevent oral diseases effectively.

WHO recommends the establishment of information systems for monitoring and evaluating implemented programmes. Information about self-assessment of oral health is important for identification of appropriate approaches when promoting oral health. Additionally, for design strategies and effective plans to meet a specific group's needs, information about the prevalence of risk factors can be added and merged with clinical oral health. Merging clinical oral health information and risk factors into the same database, reveals the oral health effects on social behaviour and can help us design consistent intervention strategies (WHO 2013). Adolescence is a period of life which a person is more vulnerable and needs more attention to health in general including oral health, due to their independence regarding consumption of sugary foods and other oral health habits that increase the risk to oral health (Granville-Garcia *et al*. 2010). Therefore it is important to understand how much adolescents know about their

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own oral health status, their behaviours and risk factors, so strategies can be developed based on evidence.

This study sets out to get information about adolescents from urban and peri-urban public schools through self-assessment of oral health habits and behaviours, frequency of visits to the dentist and the reasons, as well as the presence of oral health risk factors such as diet and tobacco.

1.2. The Research Hypothesis

The hypothesis stated that school location does not interfere with oral health status self-perception. The study set out to test whether students attending urban and peri-urban schools have the same oral health status perception.

1.3. Aims and Objectives

1.3.1. Aim

The aim of this study was to assess the self-perception of oral health status, behaviours and risk factors among adolescents attending public schools in urban and peri-urban areas of Maputo City

1.3.2. Objectives

   i.   To describe the self-perception of the oral health status in adolescents;

  ii.   To measure the degree of association between educational level and oral health behaviour;

 iii.   To determine the frequency of oral health risk factors among adolescents;

  iv.   To establish the relationship between age and risk factors for oral health;

   v.   To identify the main causes of dental services utilization;

  vi.   To establish the relationship between the oral health status and quality of life;

 vii.   To verify the difference of oral health status self-perception among adolescents attending public schools in urban and peri-urban areas of Maputo City.

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CHAPTER 2

2. LITERATURE REVIEW
2.1. Introduction

The knowledge of a person´s perception of dental treatment need is important to plan oral health care regarding resource allocation. Research has demonstrated that there is a need to establish treatment according to some individual's aspects, so that it may lead to dental treatment adherence and healthy practices. It can also support the assessment of quality of life and health education, as it is known that the use of subjective indicators can support the targeting of a specific group of population with specific plans (Batista *et al*. 2012). Self-assessment of oral health is considered as one of the approaches for monitoring oral health status. Comfort or discomfort expression with oral health conditions are among the most important indicators because they integrate the values and confidence, and socio-cultural history (AAstrøm and Mashoto 2002).

Oral health is important to well-being and health in general. Individuals with a healthy mouth are capable of eating, speaking and socializing without experiencing any pain or discomfort. The chance of having limited activities is about 12 times greater for children who have bad oral health in comparison with those who do not. Children lose more than 50 million hours of school due to oral health problems which affects their performance at school and may influence negatively their success in the future (Kwan *et al*. 2005).

Information is indispensable to influence population´s oral health behaviour so that oral health promotion can be effective. Also important is how the information is linked to different factors like tobacco and alcohol consumption, family structure, dietary and physical activities, education level and socioeconomics status (Jiang *et al*. 2005). Oral health information can be strengthened during school years, because this is the most important time to influence children´s lives while skills and attitudes are developing. Schools are the perfect stage for oral health promotion for its facility to reach children worldwide (Kwan *et al*. 2005).

This literature review will start by contextualizing and characterizing the location where the study was conducted. Some basic information about Mozambique, specifically Maputo city will be presented. This chapter will then focus on different factors related to oral health and which will be addressed in the research, such as oral diseases, oral health self-assessment, oral health risk factors, oral health behaviour and use of dental services.

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2.2. Mozambique

Mozambique is located on the southeastern coast of Africa, with an approximate area of 799,380 km2 a coastal strip of about 2,470 km, bathed by Indian Ocean. It is bordered to the north by Tanzania, on the northwest with Malawi and Zambia, on the west with Zimbabwe and Swaziland and on the south with South Africa. It is divided into 11 provinces and 144 districts, Niassa province being the most extensive. Maputo City is the capital and the official language is Portuguese, with many different dialects in each province (INE 2017).

According to the last population census in 2017, the estimated population is 28,861,863 million inhabitants, of which 13,800,857 are men and 15,061,006 are women. The country has an annual growth rate of 2.8%, with a demographic structure characteristic of a developing country, its demographic pyramid being very broad and flattened at the top. About 40% of the population is under 15 years old, and 16.6% is under 5 years old. People at reproductive age (15-49 years) constitute approximately 49% of the population, with a mean age estimated at 17.4 years. Zambezia and Nampula provinces are the most populous with 5 and 6 million respectively, while Maputo City has the smallest population. The population´s density is 36.1 inhabitants per Km^2, with higher density in Maputo City the capital and the lowest in Niassa province. The average life expectancy is 53 years old and about 30% of the population live in urban areas (INE 2017). In 2015 the Gross Domestic Product per capita was $580 USD, which is very low, according to the definition of poverty at the World Bank. The National Health System covers half of the population and the density of health professionals is still low. The infant mortality rate is about 70 per 1000 live births and maternal mortality rate about 489 deaths per 100 000 live births. Infection with Human Immunodeficiency Virus (HIV), tuberculosis and malaria are the main causes of death. However, studies in a representative national population have shown a high occurrence of risk factors for chronic disease, and a trend towards increased hypertension and diabetes (NCDI 2018).

There are 1252 health units in Mozambique that constitute the public health network, of which 273 have dental health services distributed in the different Hospitals and Health centers, corresponding to 12.8% of the total number of health units in the country. There are in total 522 oral heath professionals who provide the oral health clinical services and promotional activities at national level. These oral health professionals comprise Dentists, (220) who are graduated in five years and technicians (234) for two years and six months, basic therapist (34) trained for a years and six months and other health professionals that include trained nurses (34). There are four Dental Faculties (2 private and 2 public), in which

Dentists are graduated and three public technical institutes for technicians. The nurses are trained at the dental facility by dentists for emergence treatments such as tooth extraction (MISAU 2017b).

Figure 1. Map of Mozambique

Source: www.google.co.mz/search?q=map+of+mozambique+provinces

Maputo City is the capital and the largest city of Mozambique. It is located in the south of the country on the western margin of the Bay of Maputo. Since 1980 the city has provincial status, and should not be confused with Maputo province that occupies the southernmost part of the Mozambican territory, except for the city of Maputo (Mapengo 2010). The municipality has an area of 347.69km2 and about 1.101.170 million inhabitants. (INE 2017). There are in total 102 primary public schools and 73 secondary public schools in Maputo City (INE 2018). Maputo City municipality has about 15 dental services distributed around the 7 districts, corresponding to 100% coverage of services by district. About 30 oral health professionals of which 18 are general dentists, 15 technicians and 5 basic oral health professionals, provide the dental services (DSCM 2017). Those do not include the professionals of the Maputo Central Hospital which has 15 oral professionals of which six are General Dentists and nine are

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specialists (five Oro and Maxillofacial Surgeons, one Pediatric Dentist, two Orthodontists and one Prosthodontics) and is also located in Maputo City (MISAU 2017b).

2.3. Oral diseases

Oral diseases are one of the biggest public health problems worldwide, with an impact on people´s lives resulting from the pain and malfunction and negative influence on quality of life. Dental caries and periodontal disease are the classically most relevant universal oral health concerns (Petersen *et al.* 2005). It is estimated that at least 3.58 billion of people around the world are affected with oral diseases, with dental caries on permanent teeth the most prevalent (WHO 2018). Dental caries is considered the biggest oral health issue in most developed countries, affecting 60-90% of schoolchildren and a large number of adults. Numbers shows that the level of dental caries is high in certain developed countries in America and Europe, while in several African countries it is less severe with a trend to increase mainly due to increasing sugar consumption and deficient fluoride exposure (Petersen 2004). In Mozambique a study conducted on adolescents aged 12 years old of the urban and peri-urban schools of Maputo City, showed that the prevalence of dental caries was 39.9% (DMFT = 0,99), which is very low, suggesting this was not a public health problem in Maputo City (Mapengo 2010). Another study conducted in Matola city, also in Mozambique on adolescents aged 12 and 15-19 years old, showed a prevalence of dental caries of 27.3% for 12 years old and 30.2% for group age 15-19 years old (MISAU 2017a).

Dental caries is the most common disease that is possible to prevent but has a negative impact and can influence children´s development. After the disease begins, it develops into a severe public health issue. The strategies applied to prevent it include educational programmes, oral health awareness, fluoride and sealants application (Nair and Singh 2016).

Tooth loss can also be attributed to periodontal disease in adults. When it is severe this loss is found in about 5-20% of adults worldwide. In a few cases about 2% of youth are affected with this condition which is the result of aggressive periodontitis and during puberty leading to premature tooth loss (Petersen *et al.* 2005). Suggestions are that there is a higher susceptibility to many diseases as one goes down through social status and that the social surrounding and circumstances are determinants for ones behaviours (Watt and Sheiham 2012).

In Mozambique, a study conducted in health centers of Maputo province, involving patients aged from 15 to 72 years old, showed that the prevalence of periodontal diseases was 83.3%. The same study concluded that the total prevalence of different forms of periodontal disease

was 100% if it was measured by at least one or more sites bleeding after probing (Mendes 2013).

Prevention of oral diseases such as dental caries and gingivitis depends mostly on the behaviour of children and their caretakers. Focusing on people´s behaviours can improve oral health status treatment results, and consequently, their quality of life (Eisalhy *et al.* 2015).

2.4. Oral health self-assessment

Self-assessed oral health is based on the measurement of a person´s self-perception of oral health (Atchison and Gift, 1997; Lawal, F.B. *et al.* 2013), the information is crucial for identification of an appropriate approach in oral health promotion (WHO, 2013), it is generally assessed in epidemiological studies and it allows a simple evaluation of the participants general oral health condition (Yamane-Takeuchi *et al.* 2016). A self-assessment study was conducted by Jiang *et al* (2005) in order to describe oral health condition perception, knowledge of oral health, attitude and practice as well as to assess the association between oral health and socioeconomic background and school performance. The study also analyses the effect of socio-behavioural risk factor on the perceived need for dental care, and experience of dental symptom. Findings showed that students reported a need for oral hygiene instructions; Most of them brush their teeth daily and few floss. High sugar consumption was associated with toothache in 46% of the students (Jiang *et al.* 2005). While another oral health self-assessment study conducted in South Africa, which assessed only two variables (self-assessment of oral health status and degree of satisfaction with natural teeth appearance) according to language group, level of education and income level, showed that teeth and gum problems were present in disadvantaged people (less educated, low income level and black people). The same group showed dissatisfaction with appearance of natural teeth, suggesting a relationship between social factors and how they assessed their oral health (Gilbert 1994).

Members of the dental team are presumably aware of oral health. To assess their perception and knowledge, a pilot study conducted in Nigeria by Lawal F.B. *et al* to evaluate the general self-rating of oral health of dental surgeon assistant students at University College Hospital in Ibadan, suggested the perception of a need for treatment is a predictor of global self-assessment of oral health and is a result of oral health promotion among this group (Lawal, F.B. *et al*. 2013).

2.5. Oral health risk factors and behaviours

The behavioural risk factors that affect oral health are a diet rich in sugar, tobacco use, alcohol consumption abuse and debilitated oral hygiene practices. The facts that available about the accessibility of dental services are limited. An absence of both health promotion and adequate preventive actions, are likewise related to poor oral health (WHO 2013). These behavioural risk factors affect negatively not only oral health condition, but also have a negative impact on quality of life (Petersen 2003).

At the adolescent stage it is normal to learn and preserve attitudes and behaviours related to oral health, which are settled in childhood and adolescence, and these persist into adulthood. Therefore, starting interventions in the first years of school is very important to improve health behaviour and status (Sanadhya et al. 2014).

Oral health knowledge, attitudes and behaviours are related to many socioeconomic factors. The higher the socioeconomic level the better are the health behaviours, health status and oral health knowledge in comparison with those less privileged (Honkala *et al*. 2002).

Olusile *et al.* conducted a study in Nigeria involving a group of adults to determine the association between socioeconomic status, level of education, ethnic group and location with patterns of oral hygiene practices. This study showed that people with a high level of education skilled professions and older people use more dental services. Most of the participants make use of a toothbrush and toothpaste for oral hygiene practices. This is more common in women, younger people, more educated people and skilled professions. The conclusion was that age, gender, level of education, occupation were relevant determinants of oral health hygiene behaviour (Olusile *et al*. 2014).

2.5.1. Tobacco use

According to WHO, tobacco is one of the biggest threats for oral and global health nowadays. About 4.9 million people around the world have died as result of nicotine addiction. This is rising quickly, mainly in developing countries where the majority of tobacco users live (WHO 2018). Tobacco contains many addictive ingredients, mainly nicotine and releases acetaldehyde and other carcinogens. There are different types of tobacco and all of them have a risk of Squamous Cell Carcinoma, including snuff (Crispian Scully 2010), especially when it is smoked reversed (Chestnutt I.G. and Gibson, J.. 2007). Tobacco and alcohol are the main oral cancer risk factor, which its effects increases if consumed at the same time (Petersen

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2009). Studies show that smokers are more than five times more susceptible to develop oral cancer than non-smokers. And those who smoke excessively, 80 or more cigarettes daily, have more than 17 times this risk (Neville and Day 2002). Data on tobacco demonstrates that approximately a billion men and 250 million women around the world smoke, of which 35% of men and 22% of women are in developed countries and 50% of men and 5% of women are in developing countries (Petti 2009). Results of The Global Youth Tobacco Survey in Mozambique showed that 6.3% of students aged 13-15 had smoked a cigarette at least once in their life (9% male and 3,6% female) and that 10% presently use tobacco products (12,7% male and 7.4% female). In adults aged 25-64 years old, this difference also exists in gender in which the prevalence in males is 39,9% and in women18%. There were also differences in distinct areas of the country in women and in types of tobacco consumed (Silva-Matos and Beran 2012).

2.6. Oral hygiene

Oral hygiene is important to control dental plaque, maintaining the oral cavity healthy and clean by daily tooth brushing, flossing and regular visits to the dentist (Balasuppramaniem et al. 2017). Tooth brushing using fluoridated toothpaste is a positive behaviour habit that improves oral health by reducing caries and periodontal disease. Childhood is the best time to establish this oral hygiene practices and it is a huge predictor of oral health status (Spalj et al. 2014).

2.6.1. Fluoridated toothpaste

Fluoride is an important method to prevent dental caries that has a considerable evidence reinforcing its use (Lewis 2014). Studies about fluoride effects on oral health come from almost a hundred years of research. The first focused on fluoridated drinking water, both natural and artificial benefits and negative effects and shifted to expansion and evaluation of other methods of fluoride delivery (Petersen and Lennon 2004). Black and Mackay were the pioneers on the use of fluoride agents for dental caries prevention after describing fluoride effects in the early 20th century (Kanduti *et al.* 2016).

Fluoride delivery for dental caries prevention can be done in different forms and self-administered (toothpaste and mouth-rinses) is one of them, together with the community

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based (drinking water, milk and salt fluoridation) and professionally delivery options (varnish and fluoride gels) (O Mullane *et al*. 2016).

Fluoride toothpaste is the most important individual method for fluoride delivery and dental caries control as it combines with mechanical biofilm removal. It has been shown to be an efficient way to control dental caries around the world (Tenuta and Cury 2010), increasing the fluoride concentration in the saliva for about 40 minutes after brushing. Supervised tooth brushing with fluoride toothpaste is ideal and toothpaste without fluoride is not recommended (Ministério da Saúde (MS) 2009). This is the only known fluoride delivery method used in Mozambique for those who benefit from school-based programme where toothpaste is distributed to those who cannot afford it.

2.7. Use of dental services

Most of the dental services in developing countries are concentrated in the reference hospitals of urban areas making the access to these services difficult for people who live in the rural areas and not much importance is given to oral health prevention or restorative care. Most African, Asian and Latin American countries face a serious deficit of oral health professionals and the services offered in the dental facilities are normally confined to tooth extraction and emergency care. The Dentist to population ratio in most developed countries is about 1:2000 in comparison to countries in Africa where it is approximately 1:150 000 (Petersen *et al*. 2005). In Mozambique this ratio is 1:91234. Here the dental services are available in all 11 provinces and in most of districts reaching a coverage of 94% however, the access to the population is not satisfactory if we consider the distance the population have to walk to find these services (MISAU 2017).

Information about oral health status and behaviour in a certain population is important in order to plan and evaluate dental services. A study was conducted in Denmark with the objective of describing dental visits, self-perception of dental condition in the adult population and the consequence of living conditions on use of dental services. This showed that people who lived in urban areas use dental services more than those living in rural area and that women and younger people visit the dentist more frequently. The conclusion was that more effort should be put into persuading most adults to make use of the available dental services (Petersen, P.E 1983).

In this context, Vale et al. (2013) conducted a study to analyze oral health knowledge of adults and correlate variables, the conclusion was that the poor economic status associated

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with poor dental services has a high impact on the self-perception of oral health suggesting that public policies to improve quality of life should be strengthened and redirected (Vale *et al.* 2013).

Molarius et al. explored the oral health self-rated and dental attendance habits among Swedish adults between 16-84 years old, referring to the social inequalities after dental care reform in 2008. This study concluded that access to dental health services through payment, contributes to social inequalities among the Swedish population despite the dental care reforms in 2008 which included a provision of dental treatment for those groups with considerable need of subsided cost (Molarius *et al*. 2014).

The use of dental services is correlated with several factors, such as socioeconomic group, and educational level as well as patterns of culture and popular tradition. In most countries use of dental services tends to be high in higher income groups and in those more highly educated (Araújo *et al*. 2009).

2.8. Conclusion

It is clear that the literature shows that a wide range of broader social and behavioural determinants as well as more local and individual factors, contribute to the probability that adolescents and others will enjoy subsequent good or poor oral health. Understanding the array of risk factors at work in the lives of Maputo adolescents provides an important foundation on which to build health promotion strategies if they are to have any chance of making a difference to this group. This provides the rationale for this study, which sets out to establish such what factors are important in the determination of oral health in Maputo adolescents.

CHAPTER 3

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Study design

This is a descriptive cross-sectional study, fundamentally quantitative. It evaluated the self-assessment of oral health status, dental visit and reasons, oral health behaviour and use of fluoride toothpaste, consumption of sugary food and drinks, use of different types of tobacco and the parents' level of education.

3.2. Study population

The study was conducted in five public schools located in urban and peri-urban areas in Maputo city, involving adolescents (n=500) distributed as followed:

12 year olds (n=236**)**: from three public primary schools, two selected from the urban area and one from the peri-urban area. The sample size from each area was equal. The third primary school was included from the urban area because it was not possible to reach the required sample size without it. It was where the pilot was held because there was previous authorization from Department of education to work with the students in that school. All precautions were taken so that none of the children from the pilot study were included in the study.

15-19 year olds (n=264**)**: from two public secondary schools one selected from the urban area and another from a peri-urban area with equal numbers of participants from each school.

3.3. Sampling Techniques

For the selection of the study site was by convenience, due to the greater operational ease and low cost. Participants were stratified in age groups 12 and 15-19 available at the time of study in the selected schools from urban and peri-urban areas. Two primary schools and one secondary school from each area were selected. The list of students with the required ages was obtained through the teacher responsible for each class, who organized it previously. The lists contained only those with the required ages, and in both schools they were organized in a classroom in coordination with teach responsible for the classes. In order to obtain a

representative number from each age and to maximize sample size, 95% of confidence level was set with a margin for error of 5%.

3.3.1. Sample size calculation

The sample size was 500 students and the calculation was based on a national survey results from Mozambique conducted in seven provinces where the dental caries prevalence was 19.1% for adolescents aged 12 and 21.9% for those from 15-19 years old (MISAU, 2017b). In order to ensure the representativeness and maximize sample size, a 95% of confidence level was set with a margin for error of 5%.

3.4. **Data collection**
3.4.1. Data collection tool

To evaluate how adolescents assess their oral health, a structured questionnaire designed by WHO for children was used to collect data (**Appendix1a**). The questionnaire was translated into Portuguese (**Appendix 1b**) and some parts adapted to the Mozambican context, as recommended by the WHO, and coordinated with the Oral Health Department team at the Ministry of Health of Mozambique.

The first part of the questionnaire was used to collect data regarding socio-demographic variables such as gender, school location (urban and peri-urban), age of the participants and level of education of parents. In the second part of the questionnaire, the following variables were covered: self-assessment of teeth and gum, experience of pain/discomfort related to teeth, dental visit in the past 12 months, reason for the last dental visit, frequency of tooth cleaning, Instruments used to clean teeth and gums, use of fluoridated toothpaste, experience of reduced quality of life due to oral problems, frequency of eating or drinking certain foods, even in small quantities, and use of tobacco (type and frequency).

3.4.2. Data collection procedure

The data collection process was scheduled to start two weeks after the pilot study. The teachers distributed information sheets (**Appendix 2**) and consent forms (**Appendix 3**) for the parents or guardians of those adolescents age 12 and from 15-17 and a list of those students was provided. Adolescents aged 18 and 19 were also given an information sheet and a consent form so they could sign if they agreed to participate in the study. In the case of the minors,

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only those who had consent from their parents or guardians were given the assent form (**Appendix 5**) to sign in case they agreed to be part of the study.

The data collection was made using a questionnaire filled in by the students in their classroom in the presence of the researcher and two helpers. Instructions could be given if necessary, without influencing the content of the responses. The questionnaire and consent forms were stored separately to avoid relating names to the questionnaire and to guarantee the confidentiality of each participant. It is important to mention that no previous lecture about oral health was given to the students to ensure that data collected reflected the real knowledge of each student from the study. Therefore the participants answered the questionnaire based on their own knowledge at that moment.

3.5. Pilot study

Before the actual study, a previous pilot study was conducted in two primary schools involving 20 adolescents aged 12 years old (10 from an urban school and 10 from a peri-urban school) that were not part of the subsequent study, to assess the level of understanding of the questionnaires so potential misunderstandings could be avoided. This was useful to identify organizational and technical problems that could occur, save time, identify potential adversity and adjust if necessary before the survey began. The response rates were more than 90% and most of the students had doubt in the same question, one about diet. This was mainly how to fill it in, considering the different options. Therefore no significant changes on the content were made in the original questionnaire besides the translation to Portuguese.

3.6. Data analysis

Data was analyzed using StataCorp. 2017 Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC. Categorical data were described using frequencies and percentages. Categorical data were tested for associations using a Chi-Squared test, if the assumptions were met; else a Fishers´ Exact test was used. Spearman correlation tests were used to determine if there were relationships between categorical data. All tests were deemed statistically significant at *p <0.05*.

3.7. Ethical aspects

To carry out this study in adolescents, an official authorization to the education authorities of Maputo City (**Appendix 5**) was requested to work inside the selected schools with the students. The research proposal was first evaluated and approved by the Biomedical Research Ethical Committee at the University of the Western Cape (**Appendix 6a**) with **reference number BM18/1/8** on 22nd march 2018 followed by the National Bioethics Committee for health of Mozambique for ethics approval (**Appendix 6b**) with the **reference number 181/CNBS/18** on 24th May 2018.

Considering the ethical principles on human studies, after the approvals, an authorization was obtained from parents or guardians of those minor than 18 through a written consent form (**Appendix 3**). An assent form (**Appendix 4**) for participants minor than 18 was provided to sign along with the information sheet (Appendix 2), considering that they had the right to refuse to be part of the study even after their parents consent. For those participants over 18 there was also an information sheet (**Appendix 2**) and a consent form (**Appendix 3**).

All participants were explained the objective and context of the study and invited to participate in the study as well. They were informed about all the confidentiality, considering that the questionnaire was anonymous, as well as the voluntary participation and their right to refuse to be part of it with no reprisals. During the study participants had the right to an individual explanation of their doubts in case there were some.

Data were store in a locked filing cabinet during and now (after) the study and in the computer it is in a file behind a password. All questionnaire were store separately from consent form and assent form so it will not be possible to relate them

3.8. Study limitations

This study was carried out with without any financial support so the all the expenses regarding to acquisition and reposition of material as well as displacements were under the researcher responsibility.

Part of the study involved small children (12 years old) and most of the children, either forgot or lost their information sheet and consent form to the parent/guardian which increased the cost of the study because more copies had to be done.

Some parents did not consent their children to be part of the study, and those were children in the required age (12 years old) so another school had to be added to reach the desired number.

CHAPTER 4

4. RESULTS

4.1. Characterization of the sample

The sample comprised 500 adolescents stratified in groups aged 12 years old (n=236; 47.20%) and 15-19 years old (n=233; 46.60%) attending public schools in the urban (n=250; 50%) and peri-urban area (n=250; 50%) of Maputo City. In terms of the gender, there were more females (n=267; 53,4%) comparing to males (n=233; 46,6%) participants. The proportion of females was higher in both age groups (n=167; 53,4%), (**Table 1)** and in both urban and peri-urban areas, (**Table 2)**. According to the level of schools, (n=236; 47.2%) were from primary schools and (n= 264; 53%) from secondary schools. Most of the male parents/guardian of the participants completed university (n=211; 54.2%) and the majority of the mothers have secondary school or less (n=268; 64%), (**Table 3)**.

Table 1: Distribution of sample according to gender and age.

| Age group | Gender | | | | Total | |
| | Female | | Male | | | |
	n	%	n	%	n	%
12	134	(56.8)	102	(43.2)	236	(100)
15-19	133	(50.4)	131	(49.6)	264	(100)
Total	**267**	**(53.4)**	**233**	**(46.6)**	**500**	**(100)**

Table 2: Distribution of gender of participants and school location

| School location | Female | | Male | | Total | |
	n	(%)	n	(%)	n	(%)
Urban	139	(55.6)	111	(44,4)	250	(100)
Peri-urban	128	(51.2)	122	(48,8)	250	(100)
Total	267	(53.4)	233	(46,6)	500	(100)

Table 3: Distribution of education level of parent

Level of education	Secondary school or less		College/University completed		Total	
	n	%	n	%	n	%
Father or male guardian	178	45.8	211	54.2	389	100
Mother	268	63.7	153	36.3	421	100
Total	**389**		**421**		**810**	

4.2. Oral health self-assessment

The findings on oral health self-assessment were focused on the health of teeth with 92.2% (n=461) giving positive answers and 83.8% (n=419) positive about their gum health. Regarding the self-assessment of teeth health, 10.6% of the students answered that their teeth were "excellent", 11.7% classified as "very good", 24.1% thought that their teeth were "good", 49.7% said they were "normal", and only 3.7% and 0.2% reported their teeth as "bad" or "very bad", respectively, (**Figure 2**). A Chi-square test showed no statistically significant difference between female and male participants, neither between adolescents aged 12 years and group age 15-19 years old, nor between those coming from urban and peri-urban schools.

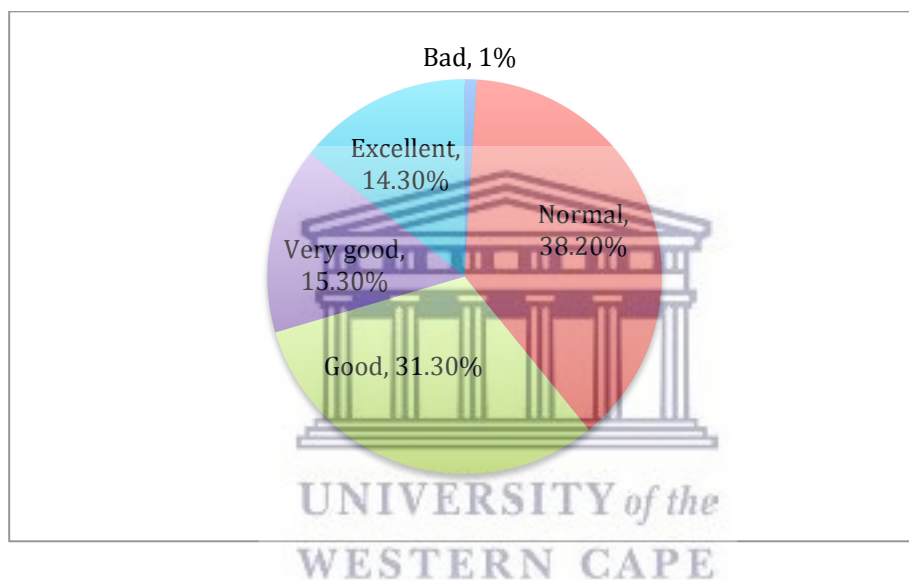**Figure 2**. Assessment of teeth health
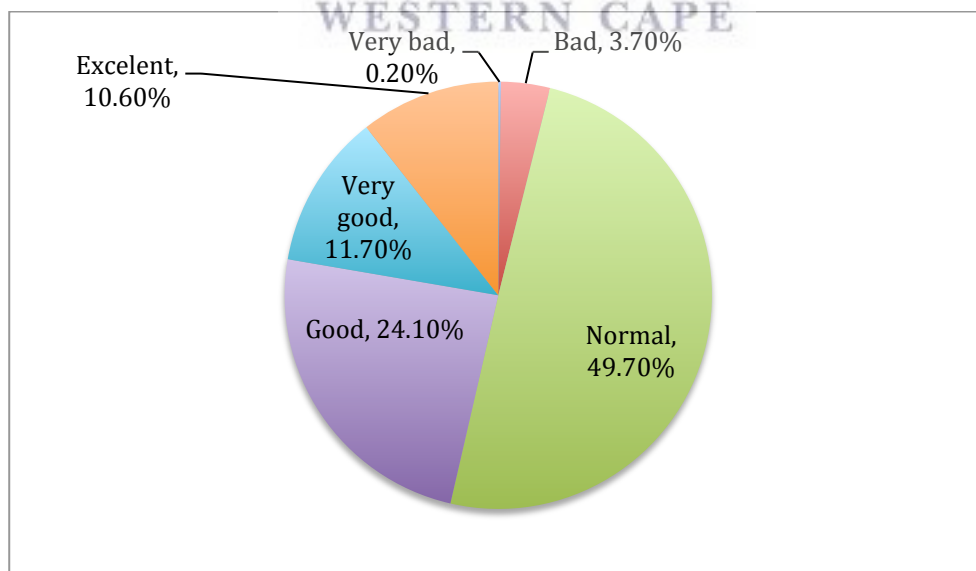
About the health of their gums, for 14.3% the evaluation was "excellent", 15.3% "very good", 31.3% considered them "good", 38.2% classified their gums as "normal" and only 1%

indicated their gums as "bad", (**Figure 3)**. Most of the students assessed their teeth and gum health as normal or good and no one considered their gums as very bad.

When asked if they experienced toothache and discomfort, the majority answered either never (n=132; 28,8%) or rarely (n=216; 47.2%), while 16.8% said occasionally and only 6.6% experienced pain and discomfort due to their teeth during the last 12 months. The Chi square test showed that there was no statistically significant difference between female and male participants, neither between adolescents aged 12 years and group age 15-19 years old nor those coming from urban and peri-urban schools.

Figure 3. Assessment of gum health

4.3. Oral health status self-perception and school location

A Spearman´s rank-order correlation was run to assess the relationship between assessment of teeth status and school location. Preliminary analysis showed the relationship to be monotonic, as assessed by visual inspection of a scatterplot. There was a very weak positive correlation between teeth status self-assessment and school location (r_s (399) = 0.114; p =0.02). Another Spearman rank-order correlation was run to assess the relationship between the teeth and gum status self-assessment. Preliminary analysis showed the relationship to be monotonic, as assessed by visual inspection of a scatterplot. There was a moderate positive correlation between self-assessment of teeth and gum status (rs (399) = 0.52, $p<0.001$).

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4.4. Dental services utilization and reasons

As to frequency of visits to the dentist in the last 12 months, the majority have never received dental care (n=176; 40%) or had no visit to dentist during the last 12 months (n=113; 26%), while 18% had dental care at least once, 8% visited the dentist twice, 5% three times and 4% visited the dentist four times in the past 12 months (**Figure 4)**.

Figure 4. Dental visits
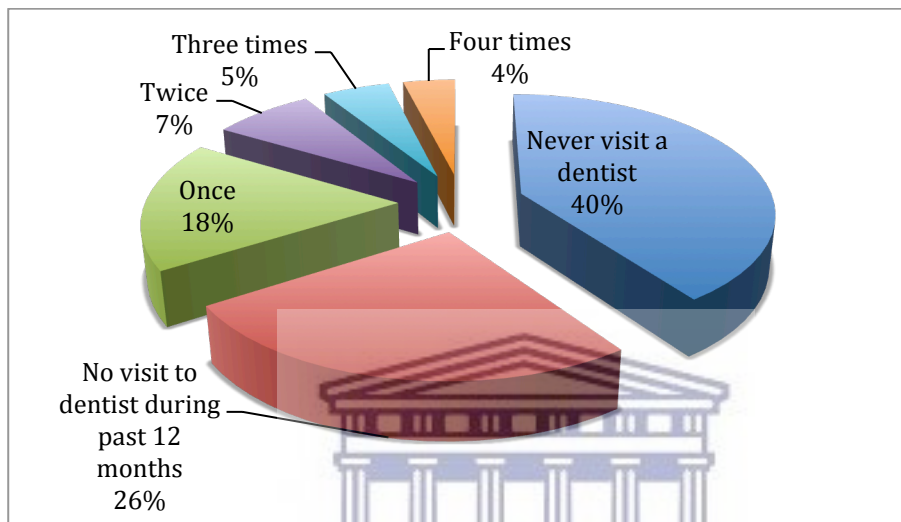
Most of those who visited the dentist had pain or problems with their teeth, gums or mouth (n=114; 67.5%), some (n=36; 21.3%) searched for dental services for a routine teeth check-up or treatment, and others (n=19; 11.2%) sought treatment/follow up treatment, (**Figure 5)**.

Figure 5. Reason to visit the dentist
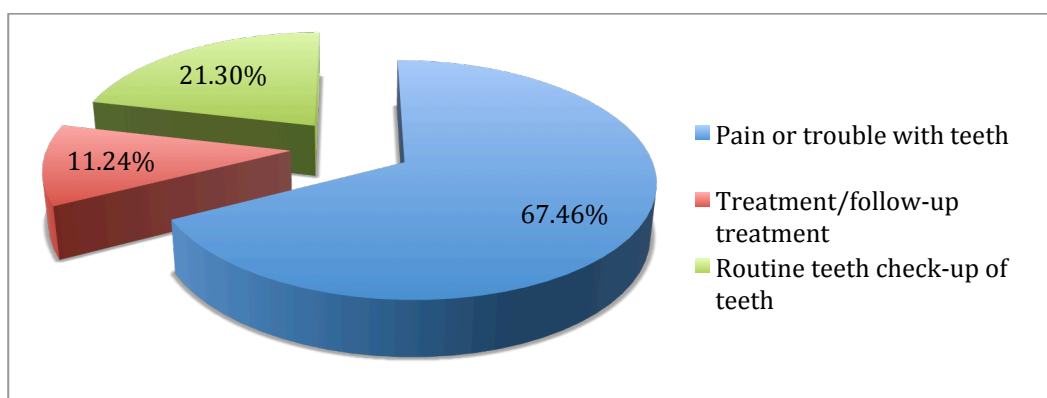
Comparing gender and dental visits during the past 12 months, showed that most of the female participants (n=99; 43.2%) had never visited a dentist or had not visited in the past 12

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months (n=46; 20.1%). Among those who visit a dentist at least once, most of them were female (85 females and only 65 males; 37% vs 31%).

Analysis showed that there is a statistically significant association between gender and number of visits to the dentist (*p=0.045*)(**Figure 6**).

Figure 6. Relationship between gender and dental visits

Table 4. Dental visits and main reasons for dental visits associated with location and age

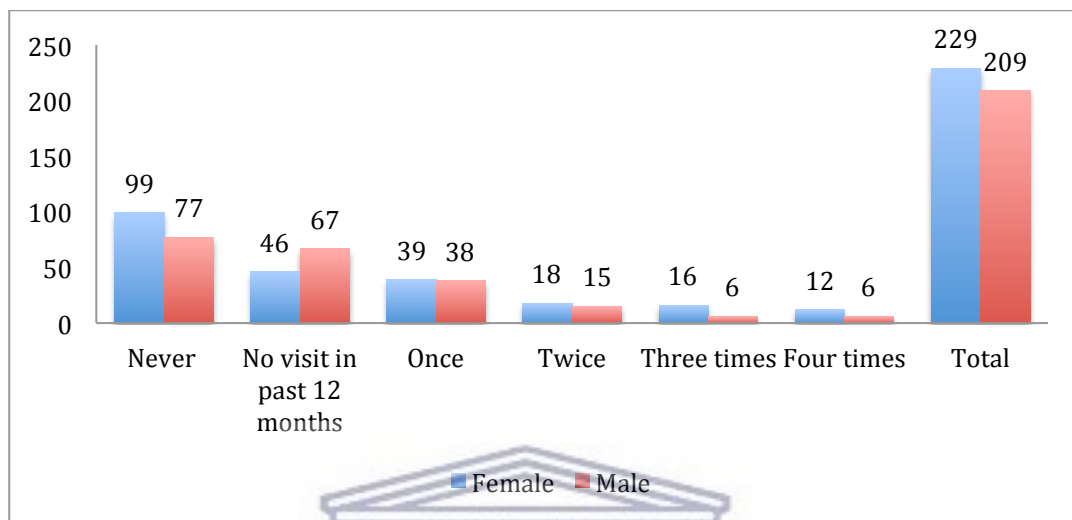| Dental visits*	School location*				Age groups***			
	Urban		Peri-urban		12		15-19	
	n	%	n	%	n	%	n	%
Never received dental care/ No visit to a dentist	73	33.6%	103	46.6%	76	37.3%	100	42.7%
No visit to the dentist in past 12 months	64	29.3%	49	22.2%	37	18.1%	76	32.5%
Once	36	16.6%	41	18.6%	46	22.5%	31	13.2%
Twice	18	8.3%	15	6.8%	17	8.3%	16	6.8%
Three times	14	6.5%	8	3.6%	15	7.4%	7	30%
Four times	12	5.5%	5	2.3%	13	6.4%	4	1.7%
Reason for dental visit**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Pain or trouble with teeth, gum or mouth	57	59.7%	57	78.1%	55	66.3%	59	68.6%
Treatment/follow up treatment	11	11.5%	8	11%	7	8.4%	12	14%
Routine teeth check-up/treatment	28	29.2%	8	11%	21	25.3%	15	17.4%

*P=0.032; **P=0.013; ***P=0.000*

After comparing the frequency of dental visit between adolescents from urban and peri-urban schools **(Table 4)**, most participants from the peri-urban schools (n=103; 46.6%) never visited

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a dentist or received a dental treatment. And from those who used dental services, the majority was because of pain or trouble with teeth. According to the age, 42.7% of adolescents from the age group 15-19 never visited a dentist/received a treatment. There was a significant statistical difference between adolescents from urban and peri-urban schools concerning dental visits (*p=0.032*) and reasons for dental visits (*p=0.013*). The same was found between dental visits and age, those with 15-19 years old had more dental visits than those with 12 years.

4.5. Oral health behaviour

4.5.1. Frequency of teeth cleaning

Results show that most of the adolescents clean their teeth twice a day (n=322; 65.2%), and others less than twice a day (n=172; 34.8%). Considering the level of education, which in this case is the level of the school, 54.3% of students from secondary, clean their teeth twice a day and 45.7% from primary schools clean twice a day (**Table 5**). The Chi square test, results showed that there was no association between school level and the frequency of cleaning teeth, as the observed *p-value=0.243* was bigger than 0.05. Assessing the frequency of teeth cleaning according to the gender, results also showed no significant difference, considering that the *P-value=0.419*.

Table 5. Association between level of school and frequency of cleaning teeth

| Frequency of cleaning teeth	Primary Schools		Secondary Schools		Total	
	n	(%)	n	(%)	X^2	P
Less than twice a day	88	(51.2)	84	(48.8)	1.365	0.243
Twice a day	147	(45.7)	175	(54.3)		
Total	**235**	**(47.6)**	**259**	**(52.4)**		

Another Spearman´s rank-order correlation was run to assess the relationship between school location and frequency of cleaning teeth. Preliminary analysis showed the relationship to be monotonic, as assessed by visual inspection of a scatterplot. There was a very weak positive correlation between age and school location (r_s (399)=0.118; *p=0.057)*. To assess the

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relationship between teeth status self-assessment and frequency of cleaning teeth, the preliminary analysis showed a very weak positive correlation between the variables (r_s (399) = 0.104; *p=0.04*).

4.5.2. Instruments used to clean teeth

Figure 7 shows the number of adolescents that use the different instruments to clean teeth and gum. Out of 500 participants, the majority (488) uses toothbrushes and few (59) use also dental floss to clean their teeth and gum.

Figure 7: Instruments used to clean teeth and gum
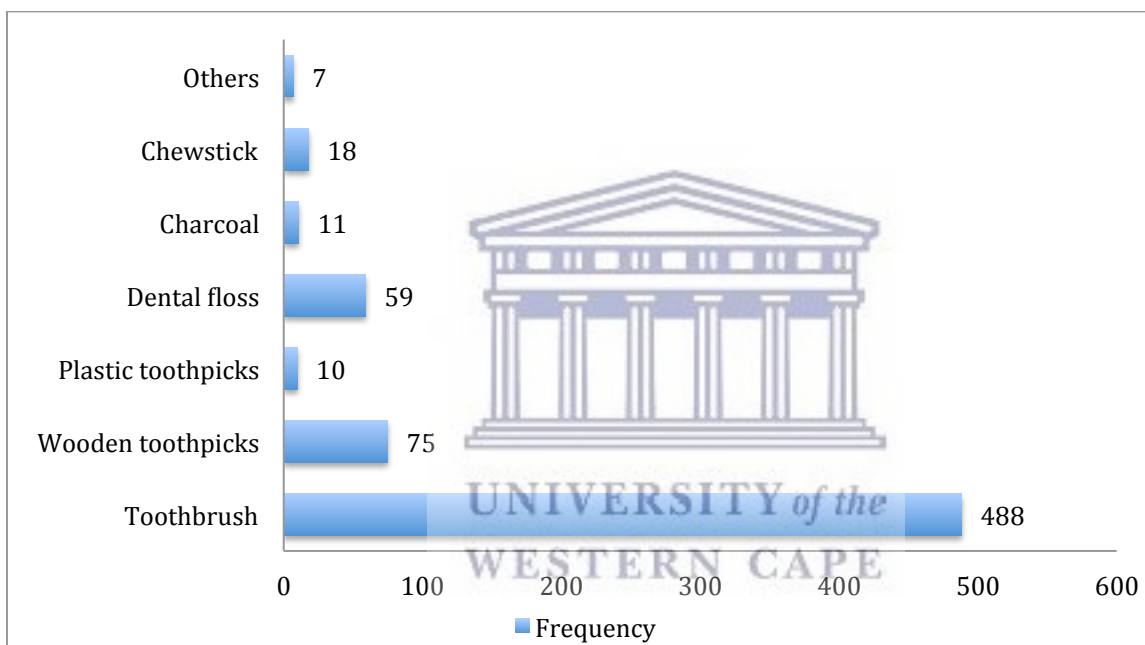
4.6. Oral health risk factors
4.6.1. Diet

Analyzing the frequency of eating and drinking, it was found that 30% of the adolescents from the study eat fresh fruit several times a week, 22.6% everyday and only 18.6% several times a day, 14.8% several times a month, 13.5% once a week e 0.7% never eats fresh fruit (Figure 7). As for biscuits and cream cakes: 30.4% eat these once a week, 24.3% several times a week, 10% eat them everyday and only 2.2% never eat biscuit and cream cakes. Coca cola and other soft drinks were consumed by 29.9% of the participants, several times a week, 25.8% consume them once a week, 17.5% claimed to consume it several times a week, 12.4%

several times a day, 11.1% everyday and only 3.3% never drink Coca cola and other soft drinks. About jam/honey: 26.1% consume this several times a month, 21.1% never eat jam/honey, 19.7% once a week, 14.2% several times a week, 10.6% reported eating every day, and the rest 8.3% said they eat jam/honey several times a day. Sweets and candy: 26.6% eat once a week, 21% several times a week, 16.2% several times a month, 15.7% everyday, 13.2% several times a day and 7.3% never eat sweets and candy. 49.8% drink milk with sugar every day, 23.4% drink milk with sugar everyday, 9.4% several times a day and 19.1% never. Most of the adolescents (49.8%) drink tea with sugar everyday, 17.5% several times a day and only 4.5% never drink tea with sugar. The graphs below show the frequency of consumption of fresh fruit (**Figure 7**) and tea with sugar among this group (**Figure 8**).

Figure 8.: Frequency of consumption of fresh fruit
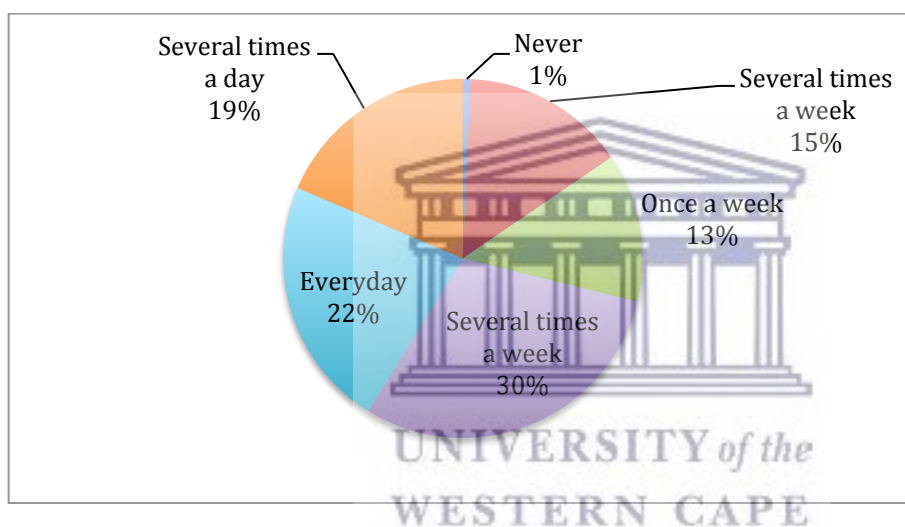
Figure 9: Frequency of drinking tea with sugar
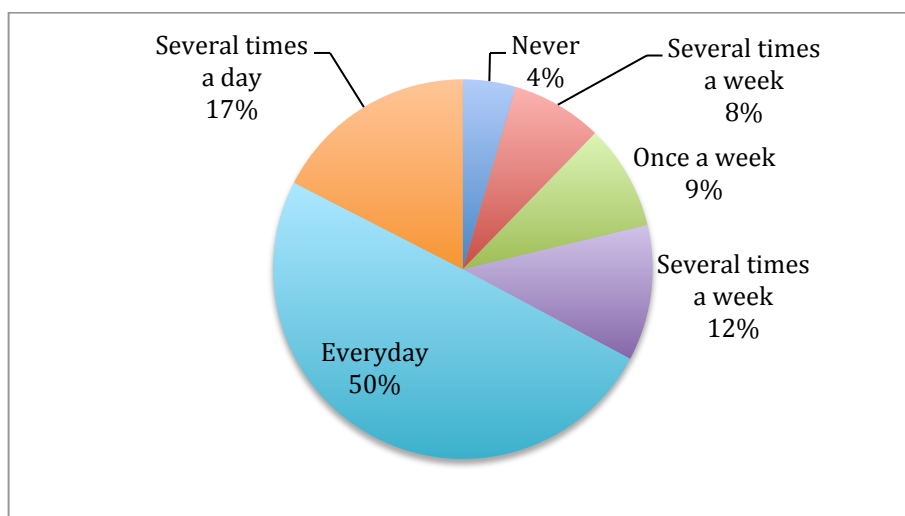
4.6.2. Use of tobacco

According to results, 99% of the adolescents never use any type of tobacco, neither cigarettes nor chewing tobacco/rape. For those who use it, less than 1% reported using it several times a week for cigarettes or cigars and chewing tobacco.

4.7. Oral health status and quality of life

The majority of the participants, 64.9% were satisfied with their teeth. Only 9% avoided laughing or smiling because of their teeth and 5% claimed that other children made fun of their teeth. Only 16% missed school due to problems with their teeth such as pain and discomfort, 18,7% had problems or difficulties on biting hard food and 10,4% had a problem with chewing.

Tables 6 and **7** below show the relationship between problems adolescents experienced during the past year because of the state of their mouth, teeth or gum health respectively. Adolescents who were not satisfied with appearance of their teeth (76.9%), evaluated their teeth health as bad and those who were satisfied (81.6%) classified their dental appearance as excellent.

Table 6. Teeth health status assessment and problems because of teeth and mouth state

Problems experienced because of teeth and mouth state	Assessment of teeth health				
	Excellent	Very Good	Good	Normal	Bad
Not satisfied with teeth appearance*					
YES	18.4%	30.8%	28.2%	38.2%	76.9%
NO	81.6%	69.2%	71.8%	61.8%	23.1%
Avoid smiling and laughing because of teeth**					
YES	2.4%	10.3%	6.02%	8.8%	33.3%
NO	97.6%	89.7%	93.9%	91.6%	66.7%
Other children make fun of my teeth***					
YES	5.1%	5,3%	3.7%	4.3%	27.3%
NO	94.9%	94.7%	96.3%	95.7%	72.7%
Missed school because of discomfort and toothache					
YES	15.4%	15.0%	11.8%	15.4%	42.9%
NO	84.6%	85.0%	88.2%	84.6%	57.1%
Difficulty biting hard food					
YES	12.2%	12.5%	15,7%	23.2%	41.7%
NO	87.8%	87.8%	84.3%	76.8%	58.3%

Observed *p-value*: *p=0.002; **p=0.013; ***p=0.019;

As indicated in **Table 6**, most of those who classified their teeth health as excellent had no problems such as not being satisfied with teeth appearance (81.6%), avoiding smiling and laughing (97.6%), no children would make fun of their teeth (94.9%), did not miss school because of toothache (84.6%) and had no difficulty biting hard food (87.8%). On the other hand, among those who assessed their teeth health status as bad, 76.9% were not satisfied with their teeth appearance. The Chi square test showed that there was an association between the assessment of teeth status and problems experienced because of teeth and mouth state, as the *p-value* was lower than the *0.05* for several variables in the above table: Not satisfied with teeth appearance (*p=0.002*), avoiding smiling and laughing because of teeth (*p=0.013*) and other children make fun of my teeth (*p=0.019*).

Table 7. Gum health status assessment and problems because of teeth and mouth state

Problems experienced because of teeth and mouth state	Assessment of gum health					
	Excellent	Very good	Good	Normal	Bad	Total
Not satisfied with teeth appearance*						
YES	32.7%	24.5%	29.6%	39.3%	100%	32.7%
NO	67.3%	75.5%	70.4%	60,7%	0%	67.3%
Avoid smiling and laughing because of teeth						
YES	10.6%	2.3%	7.0%	9.2%	33.3%	8%
NO	89.4%	97.7%	93.0%	90.8%	66.7%	92%
Other children make fun of my teeth						
YES	4.4%	2.3%	6.1%	5.3%	0%	5%
NO	95.6%	97.7%	93.9%	94.7%	100%	95%
Missed school because of discomfort and toothache						
YES	17.0%	19.6%	10.9%	17.7%	0%	15.6%
NO	93.0%	80.4%	89.1%	82.3%	100%	84%
Difficulty biting hard food						
YES	10.6%	12.8%	18.9%	21.5%	50.0%	17.9%
NO	89.4%	87.2%	81.1%	78.5%	50.0%	82.1%
Difficulty in chewing*						
YES	8.3%	6.4%	14.3%	8.8%	66.7%	10.7%
NO	91.7%	93.6%	85.7%	91.2%	33.3%	89.3%

* Observed *p-value=0.012*

Results on **Table 7** showed the majority of adolescents who had classified their gums as excellent had not experienced problems because of teeth and mouth state such as not being satisfied with teeth appearance (67.3%), avoiding smiling and laughing because of teeth (89.4%), other children making fun of their teeth (95,6%), missed school because of

discomfort or toothache (93%), difficulty biting (89.4%) and difficulty in chewing (91.7%). The Chi square test showed an association between assessment of gum health status and difficulty in biting hard food as indicated in the table (*p-value=0.012*).

CHAPTER 5

5. DISCUSSION

Studies about oral health self-assessment in Mozambique are non-existent and the few studies about oral health status are still scarce or old. The central aim of this study was to evaluate the self-perception of oral health status, behaviours and risk factors among adolescents attending public schools from urban and peri-urban areas of Maputo City. The study was based on data collection using a self-completion questionnaire designed by WHO and translated to Portuguese, the official language used in Mozambique. This chapter provides an interpretation of the study findings by comparing with other studies conducted on the same age group and themes. The discussion will be presented by different topic and considering the objectives of the study.

5.1. Oral health self-assessment

Results found in the present study showed that most of the adolescents evaluated their oral health as normal (49.7% for teeth and 38.2% for gum) and good (24.1% for teeth and 31.3% for gum), 10% classified the teeth as excellent and 11.7% as very good. Only 3.7% of the adolescent classified their teeth as bad and 1% thought their gums were bad too. Comparing the school location results, there was no significant statistical difference between adolescents from urban and peri-urban schools concerning self-assessment of teeth and gum health.

Another study involving adolescents aged 12 and 15 years old to evaluate oral health assessment conducted by (Vadiakas *et al*. 2011) showed that 60.9% of 12 year olds and 61% of 15 year olds assessed their oral health as moderate, one third classified as good and only 5% of both ages said that it was poor. The same study, found a difference in perceived oral health status between adolescents aged 15 years old from rural and urban areas. Garbin *et al*. (2009) found in their studies that most of the adolescents aged 14-17 years old evaluate their oral health as very good (53.6%). For Jiang *et al*. (2005), in a study involving Chinese students, found that most of them classified their teeth as good in general, only 12% said it was poor or very poor and 9% said their gum health was poor or very poor. Results from a Brazilian National Oral Health Survey from project Saúde Bucal called "SB Brazil 2010", conducted in 2010, showed that 47.5% of 12 year olds and 45% from groups aged 15-19, were satisfied with their oral health (MS 2014).

5.2. Oral health behaviour and risk factors

The increased intake of cariogenic food and drinks, as well as inadequate oral hygiene techniques are probably the main causes of heightened dental caries activity in adolescence. Therefore the use of fluoridated toothpaste as a topical fluoride on the tooth surface and dental floss to remove plaque is crucial. Personal education and motivation about oral health based on oral hygiene needs and disease patterns are highly recommended, as well as the professional follow up for this group in particular (AAAPD 2015). The results in the study conducted by (Mapengo 2010) in Maputo City in/Mozambique involving adolescents aged 12 years, reported a low consumption of sugar. The present study showed that 49.8% drink tea with sugar everyday, and more than 20% consume sugary beverages and food such as soft drinks, biscuits and cakes. Only 22.2% % consume fresh fruit everyday, 18.6% eat fruit several times a day and 30% several times a week.

Tobacco is one of the oral health risk factors responsible of oral cancer and periodontal disease. It reduces the immune system response to oral infection, retards healing of oral surgical wounding and in diabetics, promotes periodontal degeneration (Krisdapong *et al*. 2014). In Mozambique according to the report, the use of different types of tobacco is low. The tobacco use prevalence is 13.7% and is higher in males than in females. The prevalence of tobacco consumption is higher in Cabo Delgado Province (20.6%) and lower in Maputo City (5.2%). Individuals aged 15-24 have the lowest prevalence among all age groups which was 2.8% compared to 25-44 year olds (14,2%) and 45-64 year olds (16.1%) (Damasceno *et al*. 2016).

In the present study, 99% of the adolescents never use any type of tobacco, neither cigarettes nor chewing tobacco/rape. For those who use it, less than 1% reported using it several times a week for cigarettes or cigars and chewing tobacco. This result confirms that the use of tobacco is very low or almost non-existent among adolescents in the urban and peri-urban schools of Maputo City – assuming the respondents were honest in answering the questions.

A study conducted in Maputo Province evaluated oral hygiene habits of patients attending three health centers in Maputo Province who volunteered to be part of a study. The majority (99.17%) reported the use of conventional toothbrush and toothpaste. 80% of the participants said they brush their teeth twice a day, while 10.83% said once a day and only 9.17% brush three times a day (Mendes 2013).

Results from the present study concerning frequency of tooth cleaning, showed that most of the participants clean their teeth twice or more times a day. There was no statistically

significant difference between the educational level of the adolescents and oral health behaviour such as frequency of teeth cleaning.

5.3. Dental services utilization and main causes

There are some characteristics that differentiate adolescents from the rest of the population. This include the lack of appreciation of less severe symptoms and the lack of adherence to preventive treatments and actions (Österberg *et al*. 1998).

In the Brazilian survey, results showed that only 18% of adolescents aged 12 years had never been to a dentist and the same was found for those aged 15-19 (MS 2014). Which means that most of the adolescents visited a dentist at least once.

In Mozambique, the study conducted in Maputo Province showed that most of the participants (77%) never visit a dentist, and of those who did, 40% visited at least once a year. As for the reasons, 61.5% visited a dentist for an extraction, 30.9% because of pain and only 4.8% go for a routine check-up (MISAU 2017a).

According to Oral Health Annual Report, 52% of the treatment in the dental services is tooth extraction and only 9.7% is dental fillings at national level. In Maputo City these tooth extractions correspond to 17.6% and the dental fillings are 23.8% of the total treatments in the country (MISAU 2017b). And in the present study, which was conducted in Maputo City, 40% of the adolescents never visit the dentist, and those who had visited, 18% visited at least once a year. The reason for their dental visit was pain and trouble, for 67.46% of the adolescents, 21.30% was for treatment/follow-up treatment and about 11.24% for a routine check-up of teeth. There was a significant statistical difference between adolescents from urban and peri-urban school, where those from peri-urban schools, had far fewer visits, probably related to more limited access to dental clinics.

5.4. Oral health and quality of life

The present studies showed that 64.9% of adolescents were satisfied with the appearance of their teeth and most of those that were no satisfied were those aged 15-19. The negative impact of teeth problems was likewise low among adolescents.

Almost the same was found in the National Survey from Brazil results, which showed that most of the adolescents were satisfied with their oral health, but there were differences between regions. 36.2% of the adolescents from the northern region aged 15-19 claimed not to be

satisfied with their oral health. As for impact of oral health on daily life, 34.8% adolescents aged 12 and 15-19 years old, reported experiencing some problems such as chewing difficulties, discomfort when tooth brushing and avoiding smiling (BRASIL 2014). In China, the study conducted in adolescents from almost the same age group reported that 24% of the participants were not satisfied with their teeth appearance and 11% claimed that other children made fun of their teeth (Jiang *et al*. 2005).

On the other hand, results from a study conducted in Matola City, Mozambique, involving this same group showed that 57.3% of adolescents aged 12 years were satisfied with their teeth and mouth as well as 73.1% from group age 15-19 years old. Few of them had reported a negative impact of oral health on their daily life, 11.5% from 12 years old and 9,1% from group age 15-19 years old (MISAU 2017a)..

CHAPTER 6

6. CONCLUSION AND RECOMMENDATIONS

Generally, studies take into consideration the measurement of clinical aspects of disease, while the assessment of patient self-perception seems to be of secondary importance. Quality of life is closely associated with self-perception or understood as a translation of daily experience and the health condition. This is due to the knowledge and awareness about health and disease varying in each individual based on exposure, social and cultural rules (Vale *et al*. 2013). This study is therefore necessary to know the perception adolescents have about their own oral health, how they evaluate it considering the information they possess, how their oral health condition is influenced by their oral health behaviour and if there is any association of socio-economic condition with behaviour and lifestyle. Many studies have shown that oral health behaviours are associated with several factors such as lifestyle, socioeconomic group, oral health practices and behaviour. Risk factors is another element included among this group of topics, considering that some general diseases share the same risks with non-communicable disease.

This study was conducted using a questionnaire on oral health self-assessment and risks, which gives us the information about how the adolescents evaluate their own oral health. A clinical evaluation of the participants would be important to complete the information collected about the oral health and confront oral health self-assessment with the real oral health state of the participants.

After analyzing the collected data, some of the most important findings arising from this study are summarized below.

Most of the adolescents describe their oral health as normal and very few as bad or very bad and among those who assess it as bad; the majority was not satisfied with their teeth.

Oral health status does have some influence on their quality of life, as those who reported bad oral health had problems such as avoiding smiling and laughing and were not satisfied with the appearance of their teeth.

There was very little difference between adolescents from urban and peri-urban schools concerning oral health behaviour and most of them brush their teeth twice a day using toothbrush with toothpaste;

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Almost all adolescents in the study don´t use any kind of tobacco, suggesting that this is not a problem for this group in particular assuming their honesty when answering the questions. However almost half of the adolescents in the study consume sugary drinks and foods.

Most of the adolescents have never visited a dentist, and the main cause of dental service utilization was pain and trouble with teeth. There was no difference in this regard between urban and peri-urban schools.

Revisiting the questions proposed to answer in this study we can state that:

1. There was a little difference in self-perception but not statistically significant between adolescents from schools from urban and peri-urban areas;

2. There was no statistically significant difference between the educational level of the adolescents and oral health behavior;

3. Assuming that all participants were honest about tobacco consumption, no relevant information was found about consumption of tobacco as one of the risk factor. And concerning to sugary diet;

4. According to the results of this study oral health condition did not affected the quality of life of the adolescents.

As a recommendation, a school-based oral health promotion programme should be implemented. Besides basic topics about oral health practices, it must also include key information such as nutritional education, oral health risk factors and their impact on oral health. Above all, information on how oral healthy life style choices are part of practices necessary to achieve good general health.

http://etd.uwc.ac.za/
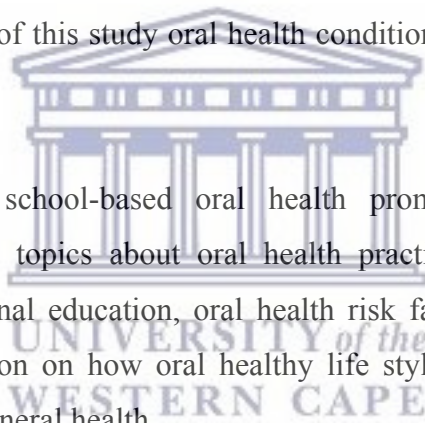
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8. APPENDICES

8.1. Appendix: questionnaires

8.1.1. Questionnaire (English version)

World Health Organization

Oral Health Questionnaire for Children

First, we would like you to answer some questions concerning yourself and your teeth

---

Identification number	**Sex**		**Location**		
	Boy	Girl	Urban	Periurban	Rural
1. ☐☐☐☐	☐	☐	☐	☐	☐
1 4	1	2	1	2	3

---

2. **How old are you today?** _____
                             (Years)

---

3. **How would you describe the health of your teeth and gums?**
(Read each item)

	Teeth	Gums
Excellent	☐ 1	☐ 1
Very good	☐ 2	☐ 2
Good	☐ 3	☐ 3
Average	☐ 4	☐ 4
Poor	☐ 5	☐ 5
Very poor	☐ 6	☐ 6
Don't know	☐ 9	☐ 9

---

4. **How often during the past 12 months did you have toothache or feel discomfort due to your teeth?**

Often	☐ 1
Occasionally	☐ 2
Rarely	☐ 3
Never	☐ 4
Don't know	☐ 9

Now please answer some questions about the care of your teeth

---

5. **How often did you go to the dentist during the past 12 months?**

(Put a tick/cross in one only)

Once	☐ 1
Twice	☐ 2
Three times	☐ 3
Four times	☐ 4

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More than four times .... ☐ 5
I had no visit to dentist during the past 12 months .... ☐ 6
I have never received dental care/visited a dentist .... ☐ 7
I don't know/don't remember .... ☐ 9

If you did not see a dentist during the last 12 months, go on to question 7

6. **What was the reason for your last visit to the dentist?**
   (Put a tick/cross in one box only)
   Pain or trouble with teeth, gums or mouth .... ☐ 1
   Treatment/follow-up treatment .... ☐ 2
   Routine check-up of teeth/treatment .... ☐ 3
   I don't know/don't remember .... ☐ 9

7. **How often do you clean your teeth?**
   (Put a tick/cross in one box only)
   Never .... ☐ 1
   Several times a month (2–3 times) .... ☐ 2
   Once a week .... ☐ 3
   Several times a week (2–6 times) .... ☐ 4
   Once a day .... ☐ 5
   2 or more times a day .... ☐ 6

8. **Do you use any of the following to clean your teeth or gums?**
   (Read each item)

	Yes 1	No 2
Toothbrush	☐	☐
Wooden toothpicks	☐	☐
Plastic toothpicks	☐	☐
Thread (dental floss)	☐	☐
Charcoal	☐	☐
Chewstick/miswak	☐	☐
Other	☐	☐

   Please specify_____

9.
                                                             Yes   No

   a) **Do you use toothpaste to clean your teeth** .... ☐ 1 ☐ 2

                                                             Yes   No

   b) **Do you use toothpaste that contains fluoride?** .... ☐ 1 ☐ 2

                                                          Don't know .... ☐ 9

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10. **Because of the state of your teeth and mouth, have you experienced any of the following problems during the past year?**

	Yes 1	No 2	Don't know 0
(a) I am not satisfied with the appearance of my teeth	☐	☐	☐
(b) I often avoid smiling and laughing because of my teeth	☐	☐	☐
(c) Other children make fun of my teeth	☐	☐	☐
(d) Toothache or discomfort caused by my teeth forced me to miss classes at school or miss school for whole days..............................	☐	☐	☐
(e) I have difficulty biting hard foods	☐	☐	☐
(f) I have difficulty in chewing...................	☐	☐	☐

11. **How often do you eat or drink any of the following foods, even in small quantities?**
(Read each item)

	Several times a day 6	Every day 5	Several times a week 4	Once a week 3	Several times a month 2	Never 1
Fresh fruit..................	☐	☐	☐	☐	☐	☐
Biscuits, cakes, cream cakes, sweet pies, buns etc...................	☐	☐	☐	☐	☐	☐
Lemonade, Coca Cola or other soft drinks ..	☐	☐	☐	☐	☐	☐
Jam/honey...................	☐	☐	☐	☐	☐	☐
Chewing gum containing sugar	☐	☐	☐	☐	☐	☐
Sweets/candy...............	☐	☐	☐	☐	☐	☐
Milk with sugar...........	☐	☐	☐	☐	☐	☐
Tea with sugar	☐	☐	☐	☐	☐	☐
Coffee with sugar … ..	☐	☐	☐	☐	☐	☐

(Insert country-specific items)

12. **How often do you use any of the following types of tobacco?**
(Read each item)

	Every day 6	Several times a week 5	Once a week 4	Several times a month 3	Seldom 2	Never 1
Cigarettes, pipe or cigars ...	☐	☐	☐	☐	☐	☐
Chewing tobacco or snuff ..	☐	☐	☐	☐	☐	☐

13. **What level of education has your father completed (or your stepfather, guardian or other male adult living with you)?**

No formal schooling.. ☐ 1
Less than primary school... ☐ 2
Primary school completed .... ☐ 3
Secondary school completed... ☐ 4
High school completed .... ☐ 5
College/university completed .... ☐ 6
No male adult in household .... ☐ 7
Don't know.. ☐ 9

14. **What level of education has your mother completed?**

No formal schooling.. ☐ 1
Less than primary school... ☐ 2
Primary school completed .... ☐ 3
Secondary school completed... ☐ 4
High school completed .... ☐ 5
College/university completed .... ☐ 6
No female adult in household.. ☐ 7
Don't know.. ☐ 9
(Insert country-specific categories)

That completes our questionnaire
Thank you very much for your cooperation!

Year	Month	Day	Interviewer	District	Country
☐☐	☐☐	☐☐	☐☐	☐☐	☐☐☐☐

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8.1.2. Questionnaire (Portuguese version)

Primeiro, gostaríamos que respondesses algumas perguntas sobre ti e os teus dentes	

1.

	Identificação	Sexo		Localização da escola	
		Menina	Menino	Urbano	Peri-urbano
	☐☐☐☐	☐	☐	☐	☐
	1 4	1	2	1	2

2. Que idade tens hoje? _____
  (Anos**)**

3. Como descreve o estado dos seus dentes e gengivas?
(Lê cada item)

	Dentes	Gengivas
Excelente ……………………………………………………	☐ 1	☐ 1
Muito bom …………………………………………………	☐ 2	☐ 2
Bom …………………………………………………………	☐ 3	☐ 3
Normal ………………………………………………………	☐ 4	☐ 4
Mau …………………………………………………………	☐ 5	☐ 5
Muito mau …………………………………………………	☐ 6	☐ 6
Não sabe ……………………………………………………	☐ 9	☐ 9

4. Quantas vezes durante os últimos 12 meses sentiste dor de dentes ou desconforto por causa dos teus dentes?

Frequentemente ………………………………………………………	☐ 1
Ocasionalmente ………………………………………………………	☐ 2
Raramente ……………………………………………………………	☐ 3
Nunca ………………………………………………………………...	☐ 4
Não sabe ……………………………………………………………	☐ 9

Agora por favor, responde às questões relacionados com os cuidados que tens com os teus dentes

5. Quantas vezes foste ao dentista nos últimos 12 meses?
(coloca uma cruz em uma só resposta)

Uma vez ……………………………………………………………	☐ 1
Duas vezes ………………………………………………………...	☐ 2
Três vezes …………………………………………………………	☐ 3
Quatro vezes………………………………………………………	☐ 4
Mais de quatro vezes……………………………………………	☐ 5
Não fui ao dentista nos últimos 12 meses……………………………	☐ 6
Nunca teve tratamento dentário/ nunca fui ao dentista ………………..	☐ 7
Não sei/Não me lembro ……………………………………………..	☐ 9

Se não foste ao dentista nos últimos 12 meses, passa para questão 7

6. Qual foi a razão da tua última visita ao dentista?
(coloca uma cruz em uma só resposta)

Dor ou problemas de dentes, gengiva ou na boca ……………………… ☐ 1
Tratamento/Seguimento de tratamento ………………………………… ☐ 2
Consulta de rotina/check up dentário………………………………….. ☐ 3
Não sei/não me lembro ………………………………………………...… ☐ 9

7. Quantas vezes escovas os dentes?
(coloca uma cruz em uma só resposta)

Nunca ……………………………………………………………… ☐ 1
Várias vezes por mês (2-3 vezes)…………………………………….. ☐ 2
Uma vez por semana …………………………………………………… ☐ 3
Várias vezes por semana (2-6 vezes)………………………………….. ☐ 4
Uma vez por dia ……………………………………………………… ☐ 5
Duas ou mais vezes por dia ………………………………………….… ☐ 6

8. Usas alguns dos instrumentos abaixo para limpar os seus dentes?
(Lê cada item)

	Sim	Não
Escova de dentes ………………………………………	☐	☐
Palitos de madeira………………………………………	☐	☐
Palitos de plástico………………………………………	☐	☐
Fio dentário ……………………………………………	☐	☐
Carvão vegetal…………………………………………	☐	☐
Mulala/miswak …………………………………………	☐	☐
Outros …………………………………………………	☐	☐

Especifique _____

9.

	Sim	Não
a) Usas pasta dentífrica para limpar os dentes?.......	☐ 1	☐ 2

	Sim	Não
b) Usas pasta de dentífrica que contém flúor? …….	☐ 1	☐ 2

Não sabe……………… ☐ 9

10. Por causa do estado dos teus dentes, tiveste qualquer um dos seguintes problemas durante o último ano?

	Sim	Não
	1	2
a) Não estou satisfeito(a) com a aparência dos meus dentes…………………………………	☐	☐
b) Muitas vezes evito sorrir e rir por causa dos meus dentes? …………………………………	☐	☐
c) Outras crianças gozam com os meus dentes……….	☐	☐
d) Já faltei à escola por causa de dor de dentes ……….	☐	☐
e) Tenho dificuldades em morder alimentos duros…….	☐	☐
f) Tenho dificuldades em mastigar……………………	☐	☐

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11. Com que frequência costumas comer ou beber alguns dos alimentos abaixo, ainda que seja em pequenas quantidades?
(Lê cada item)

	Varias vezes por dia	Todos os dias	Várias vezes por semana	Uma vez por semana	Várias vezes por mês	Nunca
	6	5	4	3	2	1
Fruta fresca ………..	☐	☐	☐	☐	☐	☐
Biscoitos, bolos bolos com creme, bolachas, etc………	☐	☐	☐	☐	☐	☐
Limonada, coca-cola ou outros refrescos …	☐	☐	☐	☐	☐	☐
Jam ou mel………..	☐	☐	☐	☐	☐	☐
Pastilhas com açucar..	☐	☐	☐	☐	☐	☐
Rebuçados/doces ..…	☐	☐	☐	☐	☐	☐
Leite com açucar……	☐	☐	☐	☐	☐	☐
Chá com açucar…….	☐	☐	☐	☐	☐	☐
Café com açucar……	☐	☐	☐	☐	☐	☐

12. Com que frequência consome alguns dos tipos de tabaco abaixo?
(Lê cada item)

	Todos os dias	Várias vezes por semana	Uma vez por semana	Várias vezes por mês	Raramente	Nunca
	6	5	4	3	2	1
Cigarros, Charuto ou Cachimbo……….	☐	☐	☐	☐	☐	☐
Tabaco mascável ou Rapé ……………..	☐	☐	☐	☐	☐	☐

13. Qual é o nível de escolaridade que o teu pai completou (ou teu padrasto, encarregado de educação ou outro adulto do sexo masculino que vive contigo**)?**

Nunca frequentou a escola ………………………………………………… ☐ 1
Nivel primario incompleto ………………………………………………… ☐ 2
Nível primário completo ……………………………………………….. ☐ 3
Nível secundário completo ……………………………………………... ☐ 4
Universidade completa ………………………………………………… ☐ 5
Não vive com nenhum adulto do sexo masculino…………………………... ☐ 6
Não sabe ………………………………………………………………… ☐ 9

14. Qual é o nível de escolaridade que a tua mãe completou?

Nunca frequentou a escola ………………………………………………… ☐ 1
Nível primário incompleto ………………………………………………… ☐ 2
Nível primário completo ……………………………………………….. ☐ 3

Nível secundário completo ……………………………………………...	☐ 4
Universidade completo …………………………………………………	☐ 5
Não vive com nenhum adulto do sexo feminino …………………………..	☐ 6
Não sabe ………………………………………………………………	☐ 9

Terminamos o questionário.
Obrigada pela tua colaboração!

Ano	**Mês**	**Dia**	**Província**	**Distrito**	**Escola**
☐☐	☐☐	☐☐	_____	_____	_____

Entrevistador

_____

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8.2. Appendix 2

 8.2.1. Information sheet for parents/caregivers (English version**)**

1. <u>Title of the protocol</u>: Self-assessment of oral health, behaviours and oral health risk factors among adolescents from Maputo City.

2. <u>Primary researcher</u>: Amália Issufo Mepatia

3. <u>Introduction</u>: My name is **Amália Mepatia**; I am a student at University of the Western Cape, Faculty of Dentistry, Community Oral Health Department. This is an invitation for your child to participate in this study I am conducting. In this research he/she will answer to a questionnaire according to the norms advocated by National Commission of Ethics in Research on Human Beings. It is a four page questionnaire designed by WHO and includes aspects such as socio-demographic, self-assessment of oral health status and quality of life, self reported oral health behaviour and lifestyles, oral health risk factors knowledge, dental visits and daily impact of oral health.

4. <u>Background and objectives</u>: Oral health is a state of being free from mouth and facial diseases and disorders, pain and limitation functional capacity. A good knowledge is the main intention of education and promotion to increase perception of adequate oral health practice and awareness about risk factors. This study aims to **evaluate how adolescents attending schools located in urban and peri-urban areas in Maputo city assess their oral health status, behaviours and the prevalence of risk factor**.

5. <u>Methods:</u> A self-questionnaire will be use to collect data from participants. In case of minors, the researcher will complete for them, but only for those whose parents/caregivers give consent or authorization to be part of the study. It will be carried out in the urban and peri-urban area of Maputo City involving a adolescents from different group ages: 12 and 15-19 years old.

6. <u>Risks and benefits</u>: No risk is expected in this type of research, since only the application of a questionnaire will be carried out, offering no risk to the health of the research subject, based on the norms advocated by National Commission of Ethics in Research on Human Beings. Those who accept to be part of the study will benefit from a lesson about oral health basic care and oral diseases risk factors.

7. <u>Willingness</u>: Participation in this study is free, and the participant may leave at any time and for any reason, without any penalty. In relation to minors, even with consent or authorization of the parents/caregivers, they are free to refuse to be part of the study.

8. <u>Confidentiality</u>: The participation of the volunteer in this study is confidential and no name will be disclosed in any type of publication.

9. <u>Contact</u>: If you would like more information and clarify some doubts about this research, please contact the National Bioethics Committee for Health in Mozambique (21430814), the primary researcher (824526600), the student supervisor from University of the Western Cape - Faculty of Dentistry by the email: nmyburgh@uwc.ac.za or University of the Western Cape Biomedical Research Ethics Committee by email: research-ethics@uwc.ac.za.

8.2.2. Information sheet for parents/caregivers (Portuguese version**)**

1. <u>Título do protocolo</u>: Auto-avaliação da condição de saúde oral, comportamentos e factores de riscos de saúde oral na população adolescente da Cidade de Maputo.

2. <u>Pesquisador principal</u>: Amália Issufo Mepatia

3. <u>Introdução</u>: meu nome é **Amália Mepatia**, sou estudante da Universidade de Western Cape, Faculdade de Medicina Dentária. Este é um convite para a sua criança participar neste estudo. Nesta investigação científica as crianças irão responder a um questionário na escola obedecendo as normas pré-estabelecidas pelo Comité Nacional de Bioética para pesquisa em Humanos. É um questionário de 04 (quarto) páginas desenhado pela Organização Mundial da Saúde (OMS) que inclue aspectos sociodemográficos, auto avaliação da condição de saúde oral, comportamentos de saúde oral e estilos de vida, conhecimento de factores de riscos de saúde oral, visitas ao dentista e impacto da saúde oral na vida diária.

4. <u>Justificação e objectivos</u>: Uma boa saúde oral significa ausência de doenças na boca e de distúrbios faciais, dor e limitação da capacidade funcional; A educação e promoção em saúde oral é feita com objectivo de aumentar do conhecimento e a percepção de práticas adequadas de saúde oral assim a conscientização sobre seus factores de risco. Este estudo tem como objectivo **avaliar como os adolescentes das urbanas e peri-urbanas da Cidade de Maputo avaliam a sua condição de saúde oral, comportamentos e a prevalência do factores de risco**.

5. <u>Métodos:</u> Os dados serão colhidos através de um questionário. Em caso de menores de idade o mesmo poderá ser preenchido pelo pesquisador, mas somente para os que tiverem uma autorização dos seus pais/encarregados de educação para fazer parte do estudo. As faixas etárias incluídos serão: 12 e 15-19 anos de idade de 02 escolas da zonas urbana e 02 escolas da zona peri-urbana da Cidade de Maputo.

6. <u>Riscos e benefícios</u>: Nenhum tipo de risco é esperado neste tipo de pesquisa, uma vez que será apenas aplicando um questionário o que não oferece nenhum risco para a saúde do participante, de acordo com as Normas do Comité Nacional de Bioética para pesquisa em Humanos. Aqueles que aceitarem fazer parte da pesquisa irão beneficiar-se de uma palestra sobre cuidados básicos da saúde oral e factores de risco para a saúde oral

7. <u>Voluntariedade</u>: A participação neste estudo é livre, podendo o participante retira-se a qualquer momento e por qualquer razão, sem alguma penalidade para o mesmo. Para os menores de idade, mesmo com a autorização dos pais/encarregados de educação são livre de recusar em fazer parte do estudo.

8. <u>Confidencialidade</u>: A participação do voluntário no estudo é confidencial e nenhum nome será divulgado em qualquer tipo de publicação.

9. <u>Contacto</u>: Em caso de alguma dúvida sobre o estudo, entrar em contacto com o Comité Nacional de Bioética para Saúde de Moçambique (21430814), a pesquisadora principal (824526600), o supervisor da estudante da Universidade de western Cape – Faculdade de Medicina Dentária pelo email: nmyburgh@uwc.ac.za ou o Comité de Bioética da Universidade de Western Cape pelo email: research-ethics@uwc.ac.za.

8.3. Appendix 3

8.3.1. Informed Consent Form (for parent/caregiver**) – English version**

By these instruments that meets the legal requirements, Mr./Mrs./Miss _____holder of the identity card nr. _____

In charge of student´s (under 18 years) _____

After a detailed reading of the information contained in this free **Informed Consent Form**, duly explained by professionals in the smallest detail, aware of the services and procedures to which will be submitted, leaving no doubts as to what is read and explained, signing their free and informed consent clarified agreeing to let his/her child/student to participate in the research and be aware that all information provided is confidential and will be kept under professional confidentiality.

By agreeing to sign this term.

_____, on_____of _____ 2018

_____   _____
Participant´s guardian   Researcher´s signature

8.3.2. Informed Consent Form (for parent/caregiver**) – Portuguese version**

Pelo presente instrumento que atende às exigências legais, o Sr. (a) _____ portador(a) do bilhete de identidade Nº _____ encarregado de educação do(a) aluno(a) (menor de 18 anos) _____,

após leitura minuciosa das informações constantes neste **TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO**, devidamente explicada pelos profissionais em seus mínimos detalhes, ciente dos serviços e procedimentos aos quais será submetido, não restando quaisquer dúvidas a respeito do lido e explicado, firma seu **CONSENTIMENTO LIVRE E ESCLARECIDO** concordando em participar da pesquisa proposta. Fica claro que o sujeito da pesquisa ou seu representante legal, pode a qualquer momento retirar seu **CONSENTIMENTO LIVRE E ESCLARECIDO** e deixar de participar desta pesquisa e ciente de que todas as informações prestadas tornaram-se confidenciais e guardadas por força de sigilo profissional.

Por estarem de acordo assinam o presente termo.

_____, aos _____ de _____ de 2018

_____   _____
O Responsável pelo participante   Assinatura do pesquisador

8.4. Appendix 4

8.4.1. Assent form (for adolescent 12 to 17 years old**) – English version**

My name is **Amália Mepatia**. I work as dentist but I am also a student. Right now, I am trying to understand how children at your age evaluate their own oral health.

If you agree, you will be asked what do think about you mouth, if you know how is your mouth, how many teeth you have in your mouth, how do you take care of your mouth, what do you use to clean your teeth, if you ever visit a dentist, the reason to visit a dentist, until which class did your parents study, if you smoke, how often do you like sweets.

You may be helping me understand what adolescent know about their own oral health, if they need more lessons about how to take care of their own month and avoid oral diseases, will also help to find out what kind of information we need to address to adolescents.

If you agree to help me, you should know that your teacher and classmates' won´t know what you have answered in the questionnaire. You should also know that if you decide to help us or if you decide to say "no", your choice will not affect your grades or no one will be upset with you.

There are no right or wrong answers in this questionnaire. Please talk this with your parents to give their permission for you to be in this study, but even if your parent say "yes" you can still say "no" and decide not to be in the study.

If you don´t want to be in my study, you don´t have to be in it. Remember, being in the study is up to you and no one will be upset if you don´t want to be in the study or if you decide to stop after we begin, that´s ok, too. Also remember that no one else, not even your parents or teacher will know what you´ve answered.

You can ask any questions that you have about the study. If you have a question later that you didn´t think now, you can call me or ask your parents or teacher to call me at: **824526600.**

Would you like to answer this questionnaire? Yes ___ or No___. If yes, please mark yes and sign the form. If no, I appreciate your time and you are free to go.

_____, on____ of _____ 2018

_____   _____

Participant´s signature   Researcher´s signature

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8.4.2. Assent form (for adolescent 12 to 17 years old) – **Portuguese version**

Meu nome é **Amália Mepatia**. Trabalho no Ministério da Saúde mas também sou estudante. Agora, estou a tentar perceber como as crianças da tua idade avaliam a sua saúde da boca.

Se concordares, serás questionado sobre o que pensas sobre a tua boca, se sabes como está a tua boca, como é que cuidas dos teus dentes, se alguma vez foste ao dentista, porquê foste ao dentista, até que classe os teus pais estudaram, se fumas, quantas vezes comes coisas doces.

Tu podes ajudar-me a compreender o que os meninos da tua idade sabem sobre a saúde da sua boca, se eles precisam de algumas palestras sobre como cuidar da sua boca e como evitar doenças orais, irá também ajudar a definir que tipo de informação deve ser dada às crianças da tua idade.

Se concordares em ajudar-me, nem o teu professor e/ou colegas irão saber o que respondeste no teu questionário. Fica a saber que se não concordares em fazer parte do estudo, a tua escolha não irá afectar às suas notas e ninguém irá ficar zangado contigo.

Neste questionário não existem perguntas certas ou erradas. Por favor fale sobre o questionário aos teus pais para que permitam que faças parte do estudo, mas saiba que mesmo que eles permitam tu podes decidir não participar no estudo. Se não quiseres fazer parte do estudo não precisas fazer. Lembra, fazer parte do estudo é decisão tua e ninguém ficará zangado contigo se decidires parar de preencher o questionário no meio do estudo.

Lembra-te também que ninguém, até mesmo teus pais ou professor irão saber as tuas respostas. Tu podes fazer qualquer pergunta sobre o estudo. Se tiveres uma pergunta depois de responder o questionário que esqueceste de fazer podes ligar-me ou pedir aos teus pais ou professor para ligar-me pelo número: **824526600**.

Gostaria de fazer parte do estudo e responder ao questionário? SIM ____ ou NÃO____. Se sim, por favor marque SIM e assine a folha, se NÃO, obrigada e está dispensado.

_____, aos____ de _____ 2018
_____   _____
Assinatura do participante   Assinatura do pesquisador

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8.5. Appendix 5

8.5.1. Department of Education´s Credential 1 (in Portuguese version)

EPÚBLICA DE MOÇAMBIQUE

Governo da Cidade de Maputo

DIRECÇÃO DE EDUCAÇÃO E DESENVOLVIMENTO HUMANO DA CIDADE DE MAPUTO

Rua Fernão Veloso n° 54 Telefone: 21415474

CREDENCIAL

A Direcção de Educação e Desenvolvimento Humano da Cidade de Maputo, credencia a senhora Amália Issufo Mepatia, estudante da Faculdade de Medicina na Universidade de Western Cape na Cidade do Cabo, a fim de realizar as um estudo na área de Saúde Oral nas escolas abaixo mencionadas da Cidade de Maputo.

Esta actividade deve ser coordenada com as direcções distritais de Educação e Desenvolvimento Humano. Apela-se uma maior colaboração por parte de V.Excias e que a implementadora do estudo no final deverá enviar o relatório em 2018.

N. B. Abaixo se apresentam os distritos abrangidos e as referidas escolas:

KaMpfumu

*Escola Primária Completa 3 de Fevereiro

*Escola Secundária Josina Machel

KaMavota

*Escola Primária Completa Estrela do Oriente

KaMubukwana

*Escola Secundária Quisse Mavota

Maputo, 27 de Dezembro de 2017

O Director

dr. Artur Armando Dombo

(Docente N1)

8.5.2. Department of Education´s Credential 2 (In Portuguese)

CONSELHO MUNICIPAL

PELOURO DE EDUCAÇÃO, CULTURA E DESPORTO

DIRECÇÃO MUNICIPAL DE EDUCAÇÃO, CULTURA E DESPORTO

Rua Fernão Veloso nº 54, 3º Andar, Telefone 823075374 Maputo

Às

Direcções Distritais de Educação e Cultura dos Distritos Municipais de KaMpfumo e KaMavota

Maputo

CREDENCIAL

Está devidamente credenciada a Senhora **Amália Issufo Mepatia**, Médica Dentista, funcionária do Ministério da Saúde- Programa Nacional de Saúde Oral e estudante para obtenção do grau de Mestrado na Universidade de Western Cape- Faculdade de Medicina Dentária na Cidade do Cabo, à realizar um estudo com alunos das Escolas Primárias Completas 3 de Fevereiro (DM KaMpfumo) e Estrela do Oriente (DM KaMavota), no próximo ano Lectivo 2018.

Esta acção deverá ser realizada em coordenação com a Direcção da Escola, sem prejuízo das actividades.

Maputo, 13 de Dezembro de 2017

A Directora

Isilda Maria Zandamela

(Inst. Téc. Ped. N1)

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8.6. Appendix 6

8.6.1. Ethical clearance BMREC (Biomedical Science Research Ethics Committee)

OFFICE OF THE DIRECTOR: RESEARCH
RESEARCH AND INNOVATION DIVISION

Private Bag X17, Bellville 7535
South Africa
T: +27 21 959 4111/2948
F: +27 21 959 3170
E: research-ethics@uwc.ac.za
www.uwc.ac.za

22 March 2018

Dr A Mepatia
Faculty of Dentisty

Ethics Reference Number: BM18/1/8

Project Title: Self-assessment of oral health status, behaviours and oral health risk factors among adolescents of Maputo City.

Approval Period: 20 March 2018 – 20 March 2019

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report in good time for annual renewal.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

PROVISIONAL REC NUMBER -130416-050

FROM HOPE TO ACTION THROUGH KNOWLEDGE.

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8.6.2. **Ethical clearance CNBS** (National Bioethics Committee for Health) **– In Portuguese**

REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DA SAÚDE
COMITÉ NACIONAL DE BIOÉTICA PARA A SAÚDE
IRB00002657

Exma Senhora
Dra. Amália Issufo Mepatia

Ref: 181/CNBS/18   **Data 24 de Maio de 2018**

Assunto: Aprovação do Comité Nacional de Bioética para Saúde (CNBS) referente ao protocolo de estudo intitulado: "*Self-assessment of oral status, behaviors and oral health risk factors amonng adolescents from urban and peri-urban public schools in Maputo City*"

O Comité Nacional de Bioética para Saúde (CNBS) analisou as correcções efectuadas no protocolo de estudo intitulado: "***Self-assessment of oral status, behaviors and oral health risk factors amonng adolescents from urban and peri-urban public schools in Maputo City***"

Registado no CNBS com o número 11/CNBS/2017, conforme os requisitos da Declaração de Helsínquia.

O CNBS dá a sua aprovação aos seguintes documentos:

- Protocolo de estudo versão 2.0 *de Maio de 2018*
- Consentimento informado versão 2.0 *de Maio de 2018*
- Instrumentos de recolha de dados 2.0 *de Maio de 2018*

Todavia, o CNBS informa que:

1- Qualquer alteração a ser introduzida no protocolo, incluindo os seus anexos deve ser submetida ao CNBS para aprovação.
2- A presente aprovação não substitui a autorização administrativa.
3- Não houve declaração de conflitos de interesse por nenhum dos membros do CNBS.
4- A aprovação terá a validade de um ano, terminando esta a 24 de Maio de 2019. Os investigadores deverão submeter o pedido de renovação da aprovação um mês antes de terminar o prazo.
5- Recomenda-se aos investigadores que mantenham o CNBS informado do decurso do estudo.
6- A lista actualizada dos membros do CNBS esta disponível na secretaria do Comité.

Sem mais do momento, queiram aceitar as nossas mais cordiais saudações.

O Presidente

Dr. João Fernando Lima Schwalbach