

**Knowledge, Attitude, Practices and Challenges Regarding Oral Health
Among Pregnent Women in Thulamela Municipality, Vhembe District,
Limpopo Province, South Africa**

I, **Fulufhedzani Musehane**, of Women in Thulamela Municipality, Vhembe District, Limpopo Province, South Africa for the Degree of Masters in Public Health hereby submitted, has not previously been submitted by me for a degree at this or any other university, that it is my original work and execution and that all material contained herein have been fully acknowledged.

Signature

Student: F. Musehane

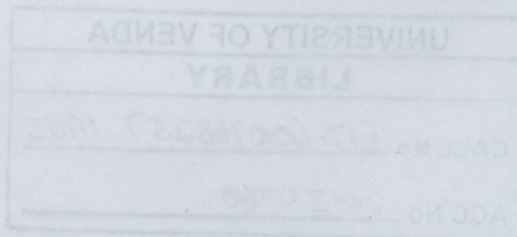
Date

By 0.04.2015

Fulufhedzani Musehane

UNIVERSITY OF VENDA
LIBRARY

**A research submitted in partial-fulfillment of the requirement for the Masters
Degree in Public Health at the School of Health Sciences, University of Venda**



SUPERVISOR: PROF H.A. AKINSOLA

CO-SUPERVISOR: MS J. MABUNDA

UNIVEN LIBRARY

Library Item : 20150960



© University of Venda

DECLARATION

I Fulufhedzani Musehane, declare that the mini-dissertation titled "Knowledge, Attitude, Practices and Challenges Regarding Oral Health among Pregnant Women in Thulamela Municipality, Vhembe District, Limpopo Province, South Africa" for the Degree of Masters in Public Health hereby submitted, has not previously been submitted by me for a degree at this or any other university, that it is my original work and execution and that all material contained herein have been fully acknowledged.

Signatures

Date

Student: F. Musehane

30.04.2015

DEDICATION

This research project is dedicated to all pregnant women in Thulamela Municipality and staff members of clinics who participated in this study (Sibasa, Thohoyandou Health Centre, William Eddie Health Centre, Tshififi, Tswinga and Mukula).

To my parents Prof Nelson Mbulaheni and Mrs Tendani Merium Musehane, my beloved son Ndivhuwo Musehane, my late grandmother Vho-Tshinakaho Musehane. My sisters Thilivhali Musehane, Mulalo Musehane, Phathutshedzo Musehane, Ndivhuwo Mariana Musehane and my brother Mathakha Musehane.

Your support and love assisted me to achieve my goal.

ACKNOWLEDGEMENTS

The fear of the Lord is the beginning of wisdom, and knowledge of the Holy One understands. (Proverbs 9:10). I appreciate the Almighty God for his grace, mercy and love. In this research project, He guided me, gave me strength and good health. I will always acknowledge Him in everything I do.

My sincere gratitude and appreciation to my Supervisor Prof H.A. Akinsola and Co-Supervisor Ms J Mabunda for their leading role without whose motivation, support and guidance this study would not have been a success. They have given their time and energy to assist me to push to the end. They have been excellent mentors for me.

I am grateful for the financial assistance that I received from Medical Research Council and National Research Fund through the University of Venda.

My appreciation and gratitude also goes to my parents Prof Nelson Mbulaheni Musehane and Mrs. Tendani Miriam Musehane who gave me moral, spiritual and material support to complete this study. To my beloved son Ndivhuwo I owe you so much of our time, you gave me time to study privately and understood when I had to leave you to attend to my research project. My sisters Thilivhali Musehane, Mulalo Musehane, Phathutshedzo Musehane for opening their doors for me and my son when I needed them most and my brother Mathakha Musehane for his encouragement and support.

My deepest gratitude goes to my younger sister Ndivhuwo Mariana Musehane, Thizwilondi Marsha and Dr.P Kaburise who assisted me with editorial work and proof reading. Research assistants Tendani Ratshivhanda, Khonani Nethengwe and Donald Ndou for data collection and Felix Chima Anyanwu for data analysis.

To all the pregnant women in Thulamela Municipality, staff members of all clinics (Sibasa, Thohoyandou Health Centre, William Eddie Health Centre, Tshififi, Tswinga and Mukula) who participated in this study, your support is highly appreciated. Your point of views gave this study direction.

I would also like to thank all my friends, class-mates, colleagues, and relatives who directly and indirectly contributed and supported me during my studies. 'A vha ntshileli'

ABSTRACT

Introduction: Oral health is an integral part of general health and wellbeing. It is of particular interest in pregnant women because they are at increased risk of developing periodontal diseases because of hormone fluctuations that occur during pregnancy. This rise in hormone levels often results to swelling of the gums and this provides a conducive environment for microorganism to cause oral infection. The aim of this study is to assess the Knowledge, Attitude, Practices and challenges regarding oral health among pregnant women attending antenatal clinics in Thulamela Municipality.

Methodology: A quantitative study using cross sectional design. The study involved 315 pregnant women attending antenatal clinic in Thulamela. Simple and systematic sampling methods were used to select participants. A self-administered questionnaire was used for data collection. Data were analyzed with Statistical Package for Social Sciences (SPSS). Chi-square test was used to compare differences between variables and statistical difference was set at $p < 0.05$.

Results: A total of 315 pregnant women participated in this study, their age ranged between 15 to 44 years of age with a mean age of 25.1 year (SD=5.8). Thirty eight percent were between 20-24 years and 48.9% showed high level of education. Almost 65% of the participants believe that there is a relationship between oral health and pregnancy. Just 55.6% have positive attitude towards the oral health facility and services provided in the antenatal clinic they attend and 47.2% believe that unborn baby can be affected by poor maternal oral care. Twenty six percent of the participants do not visit the dentist at all while 39% will visit the clinic only when there is a dental problem and a 32.1% reported that their antenatal clinic does not offer oral health services. Sixty three percent of the participants indicated that they have challenges accessing transport from home to the clinic and 60.0% of the participants reported fear of pain as the main reason for not consulting with a dentist.

Conclusion: This study shows high level of oral health knowledge (score of 3-4) among 56.6% of the participants but this knowledge has not positively influenced their attitude and practices. Therefore, a specific oral health programme is needed to help inform pregnant women in the community.

ABBREVIATIONS AND ACRONYMS

ADA- American Dental Association	i
AIDS- Acquired Immune Deficiency Syndrome	ii
CDAF- California Dental Association Federation	iii
CDC- Centre for Disease Control and Prevention	iv
CPITN – Community Periodontal Index of Treatment Needs	v
DMF- Decayed Missing and Filling	vi
DWAF- Department of Water Affairs and Forestry	vii
HIV- Human Immune Virus	viii
ID No- Identity Number	ix
KAP- Knowledge, Attitude and Practice	x
Km- Kilometers	xi
MCWH- Maternal Child and Women Health	xii
SA- South Africa	xiii
SAOHS- South Africa National Oral Health Strategy	xiv
SD- Standard Deviation	xv
SPSS- Statistical Package for Social Sciences	xvi
UNICEF- United Nations International Children’s Emergency Fund	xvii
USA- United States of America	xviii
WHO- World Health Organizations	xix
CHAPTER TWO	20
2 Literature review	20
2.1 Data based literature	21
2.1.1 Oral health in pregnancy	21

2.1.2 Risk factors for oral diseases in pregnancy	8
2.1.2.1 Tobacco/Cigarette smoking	8
2.1.2.2 Level of oral health education in pregnancy	8
2.1.2.3 Incubation of HIV/AIDS	8
2.1.2.4 Dental services during pregnancy	8
2.1.2.5 Personal-related challenges	13
CHAPTER ONE	11
1 Introduction	1
1.1 The background of the study	1
1.2 Statement of the problem	4
1.3 Rationale of the study	5
1.4 Significance of the study	5
1.5 Purpose and Specific Objectives	5
1.6 Definition of terms	6
2.5 Model	17
CHAPTER TWO	7
2 Literature review	7
2.1 Data based literature	7
2.1.1 Oral health in pregnancy	7

2.1.2 Risk factors for oral diseases in pregnancy	8
2.1.2.1 Tobacco/Cigarette smoking during pregnancy	8
2.1.2.2 Low level of oral health education in pregnancy	9
2.1.2.3 Oral manifestation of HIV/AIDS	9
2.1.2.4 Utilization of dental services during pregnancy	10
2.1.2.5 Poor Oral hygiene levels in pregnancy	10
2.1.3 Knowledge of prevention and treatment of oral disease in pregnancy	11
2.1.4 Relationship between knowledge and practice	11
2.1.5 Challenges	12
2.1.5.1 Service-related challenges	12
2.1.5.2 Personnel-related challenges	13
2.1.5.3 Individual related challenges	13
2.1.5.4 Economic challenges	14
2.1.5.5 Myths and beliefs as challenges	14
2.2 Common oral problems in pregnancy	14
2.2.1 Caries	15
2.2.2 Pregnancy gingivitis	15
2.2.3 Periodontal infection	15
2.3 Systemic causes	15
2.4 Measures taken to improve the situation or solve the problem	16
2.5 Model	17
2.5.1 Knowledge, Attitude and Practice (KAP) Model	17
Knowledge	17
Attitude	17
Practice	18

Strength of KAP Model	18
Weakness of KAP Model	19
CHAPTER THREE	20
3: Methodology	20
3.1 Study design	20
3.2 Area of study	20
3.3 Study Population	21
3.4 Sample and Sampling	21
3.4.1 Sample	21
3.4.2. Sampling	22
3.4.2.1 Sapling of clinics	22
3.4.2.2 Sample	23
3.4.3 Sapling of participants	23
3.5 Research Instrument	24
3.6 Pre-testing of the instrument	24
3.6.1 Reliability	24
3.6.2 Validity	25
3.7 Data collection procedure	25
3.8 Data analysis	25
3.9 Ethical considerations	25
3.9.1 Ethical clearance	25
3.9.2 Beneficence	26
3.9.3 Informed Consent (Appendix D)	26
3.9.4 Confidentiality	26
3.9.5 Autonomy	26

3.10 Limitation of study	26
3.11 Dissemination of results (English)	27
Appendix B: Questionnaire (Venda)	39
CHAPTER FOUR	28
4: Results	28
4.1 Introduction	29
4.2 Section A: Socio demographic characteristics of participants	29
4.3 Background Information on previous pregnancy	30
4.4 Section B: Knowledge of the participants about the importance of oral health during pregnancy	31
4.5 Section C: Attitude of participants towards oral health during pregnancy	33
4.6 Section D: Practices of participants regarding oral health	35
4.7 Section E: Challenges encountered while accessing oral health care during pregnancy	37
CHAPTER FIVE	38
5 Discussion, Conclusion and recommendations	38
5.1 Discussion	38
5.1.1 Socio-demographic characteristics of participants	38
5.1.2 Knowledge of the participants about the importance of oral health during pregnancy	38
5.1.3 Attitude of the participants towards oral health	39
5.1.4 Practices of participants regarding oral health	40
5.1.5 Challenges encountered while accessing oral health care during pregnancy	41
5.2 Conclusion	42
5.3 Recommendations	43

References	LIST OF FIGURES	44
Appendix A: Questionnaire (English)	for the participants	53
Appendix B: Questionnaire (Venda)	regarding oral healthcare during pregnancy	59
Appendix C: Letter for permission to conduct research (Province)		66
Appendix D: Participant Consent Form (English)		68
Appendix E: Participant Consent Form (Venda)		69
Appendix F: Higher Degree Committee Approval		71
Appendix G: Limpopo Province Department of Health Approval		72
Appendix H: Vhembe District Department of Health Approval		73

LIST OF FIGURES

Figure 4.1: The number of pregnancy for the participants	30
Figure 4.2: Practices of participants regarding oral healthcare during pregnancy	36
Table 4.1: September 2011 statistics of prenatal visits of the clinics under Thulamela B	
including the Department of Health (Grand total)	22
Table 4.2: The number of participants attending prenatal clinics in Thulamela B	23
Table 4.3: Demographic characteristics of the participants	29
Table 4.4: Knowledge of oral health during pregnancy	31
Table 4.5: Awareness level of knowledge	32
Table 4.6: Awareness of participants with regards to oral health during pregnancy	33
Table 4.7: Access to services of participants	34
Table 4.8: Challenges of the participants with regards to accessing oral health services during pregnancy accompanied with descriptive statistics	37

CHAPTER ONE

LIST OF TABLES

Table 3.1: September 2011 statistics of antenatal visits of the clinics under Thulamela B	
Source: Vhembe District Department of Health (Grand total 2120)	20
Table 3.2: September 2011 statistics of antenatal visits of the clinics under Thulamela B	
Sampling frame showing clusters .Source: Vhembe District Department of Health (Grand total 2120)	22
Table 3.3: The sample of participants attending antenatal clinics in Thulamela B	23
Table 4.1: Demographic information of the participants	29
Table 4.2: Knowledge of oral health during pregnancy	31
Table 4.3: Age and level of knowledge	32
Table 4.4: Attitude of participants with regards to oral health during pregnancy	33
Table 4.5: Age and attitude of participants	34
Table 4.6: Challenges of the participants with regards to accessing oral health services during pregnancy interpreted with descriptive statistics	37

CHAPTER ONE

INTRODUCTION

1.1 THE BACKGROUND TO THE STUDY

Dental caries and periodontal diseases constitute a major global public health problem and are the most common non-communicable diseases on the planet (Beaglehole, Benzian, Crail & Mackay, 2009). According to Peterson (2004), oral health is an integral element of general health and well-being. However, oral diseases affect significant proportions of the world's population and exact a heavy toll in terms of morbidity and mortality (World Health Organisation, 2005). Despite its importance for individuals and health systems, oral health is still a neglected area in both national and international health and politics (Beaglehole *et al.*, 2009). The distribution and severity of oral diseases vary in different parts of the world and within the same country or region, affecting 60-90% of school children and a vast majority of adults. Despite the great improvements in the oral health status of populations across the world, the problem still persists, particularly amongst underprivileged groups in both developed and developing communities (Peterson, 2003).

Women in general are at increased risk of developing periodontal diseases because of hormone fluctuations that occur during puberty, pregnancy and menopause. Several clinical and public health research studies suggest that around 50% of all the women, globally, experience gingivitis and if it is not treated, it can lead to periodontitis (Admin 2011). Pregnancy causes an increase in appetite and often a craving for unusual foods. If these cravings are for cariogenic foods, a pregnant woman could increase her risk of dental caries at this time. Gingivitis is the most prevalent oral manifestation associated with pregnancy. It has been reported to occur in 60 to 75% of all pregnant women. A comprehensive study conducted in 2006 indicated that gingival changes usually occur in association with poor oral hygiene and local irritants, especially plaque (Carpenter ,Glick ,Nelson, Rosa& Patton , 2006).

Improving maternal health and reducing child mortality is millennium developmental goals 4 and 5 (Building a Future for Women and Children, the 2012 Report) According to a recent Biomed Central Health Services Research, South Africa's maternal mortality rate (625 deaths/100,000 live births) is too high for a middle-income country, although over 90% of

pregnant women utilize maternal health services (Silal, Penn-Kekana, Harris, Birch & McIntyre, 2012).

Premature births and low birth weight are the leading causes of death, being the second top twenty causes of death of children under the age of 5 years in South Africa; these deaths are preventable through the delivery of standard conventional primary health care package approach (Bradshaw, Bourne & Nannan, 2003).

Keirse and Plutzer (2010), in a publication on women's attitude to and perception of oral health and dental care during pregnancy said that "even folk wisdom has linked dental health with childbirth for time immemorial, a tooth for a child. Its implication being that the demand of pregnancy includes the loss of a tooth". Vogt, Sallum, Cecatti & Morais, (2010) suggest in their comprehensive study that pregnant women suffering from periodontal disease are more at risk of delivering underweight and premature babies.

A comprehensive study conducted in 2010 indicated that globally, an estimated 13 million babies are born before 37 completed weeks of gestation, annually. The rates are generally higher in low- and middle-income countries, but also increasing in some middle- and high-income countries, particularly in America. Preterm birth is the leading direct cause of neonatal death 27% (Lawn, Gravett, Nunes, Rubens & Stanton, 2010). The level and trends in child mortality report of 2011 indicate that the value of mortality rate, of neonatal (per 1,000 live births) in South Africa was 18.00 as of 2010. Over the past 20 years this indicator has reached a high value of 23.00 in 2004 and a low value of 18.00 in 1990. At population level, the proportion of babies with low birth weight is an indicator of multifaceted public-health problems that include long-term maternal malnutrition, ill health, hard work and poor ante-natal care (WHO, 2011).

According to the United Nations International Children's Emergency Fund (UNICEF, 2004) 22% of all low-birth weight infants born in developing countries are born in Africa. The number of low-birth weight babies born in developing countries is more than double the number born in developed regions; South Africa rating is at the level of 14.6%. This percentage may increase to as much as 25% in the public sector (UNICEF, 2004). The impact of oral disease is higher in poorer countries and for populations with lower socio-economic status, mainly due to the prohibitive cost of treatment. Oral diseases, although not always life-threatening, remain a major public health problem in the African region (Peterson, 2004). Among the most prominent oral health problems currently facing Africa are dental caries,

periodontal or gum diseases, oral cancers, the oral manifestation of Human Immune Virus/Acquired Immune Deficiency Syndrome, noma, and trauma to the teeth and jaws (Peterson, 2004). In a WHO (2003) report, Peterson raised an alarm over the growing consumption of sugar; hence inadequate exposure to fluoride and high consumption of sugar could increase the problem of dental caries in Africa (Ogundipe, 2004).

Oral diseases are largely preventable by appropriate behavior which is reinforced and encouraged by public health policies and health promotion. Oral care habits are important factors for retaining good oral health. However, there are preventative behaviors that can secure good oral health, which includes brushing twice a day with fluoride toothpaste, consuming well balanced diet (low in sugary foods), avoiding smoking and making regular visits for dental care (Beaglehole *et al.*, 2009).

The WHO Assistant-Director General of Non-communicable Diseases and Mental Health (WHO, 2004) noted that, while oral diseases appear to be less severe in most African countries, with changing living conditions, dental caries were expected to increase in many developing countries of Africa. "In many developing countries, access to oral health care is limited and dental problems are often left untreated. In Africa, the dentist-to-population ratio is approximately 1:150,000, against about 1:2,000 in most industrialized countries (WHO, 2004)".

Peterson (2004) emphasizes the change in lifestyle factors which significantly impact on oral health and oral diseases. Lifestyle factors qualify as major public health problems owing to their high prevalence and incidence in all the regions of the world. Like all diseases, oral diseases affect primarily the disadvantaged and socially marginalized populations, causing severe pain and suffering, impairing functional ability and impacting on the quality of life. Traditional treatment of oral diseases is extremely costly even in industrialized countries and is unaffordable in most low and middle-income countries (Peterson, 2004).

According to Thorpe (2006), education and training constitute major challenges in Africa. The way oral health personnel are currently trained in Africa does not equip them with skills to deal with community development. Their training focuses on specialized, urban-based, curative care with little exposure to the realities of life in Africa. In short, it is too technical, ignores the community, it is not based on real oral health needs, it is based on cure, not prevention, and it is not subject to systematic planning and evaluation (Thorpe, 2006).

According to the U.S. Centre for Disease Control, the very inexpensive fluoridation of drinking water has since correlated to significant reductions in incidences of tooth decay (15-40 percent) in communities across the African countries (Johnston & Shoreline, 2007). Approximately 1.1 billion people in low and middle income countries lack access to safe water for drinking, personal hygiene and domestic use. In-Sub Saharan Africa, 42% of the population is still without healthy water. However while small amounts of fluoride will prevent tooth decay, excessive amounts can lead not only to irreversible tooth discoloration called "fluorosis" but also to other health issues, including an increased risk of bone breakage and osteoporosis (WHO, 2004).

Chikte (2009) indicated that in 1994, an estimated 14 million South Africans lacked access to a formal water supply, according to the Department of Water Affairs and Forestry (DWAf) the majority of dental fluorosis sufferers are mainly blacks and they live in rural areas. Ncube and Schutte (2005) found that the problems of high fluoride ion concentrations were centered in Limpopo, Northern Cape, North-West and Kwa-Zulu-Natal Provinces and these provinces have a high population levels still living in rural areas. Efforts to use water as a vehicle to improve oral health have not been realized yet in accordance with expectations in South Africa (Chikte, 2009). Oral diseases are common in South Africa, affecting about 70 % of the population (Venter 2004). According to the South African National Oral Health Strategy (SAOHS), oral disease levels appear to be increasing in major sectors of the South African population, especially the under-served, disadvantaged and non-urbanised communities.

1.2. Statement of the problem

Periodontal diseases result from poor oral health. In 2012, Shathini, Vanka, Bhambal, Saxena, Saxena & Kumar reviewed association of pregnant woman periodontal status to preterm and low-birth weight babies. The review was done systematically and evidence based. Their findings were that all studies they reviewed suggested that periodontal disease may be a potential risk factor for preterm and low birth weight babies. (Shathini *et al.*, 2012). In South Africa, there is paucity of data on this relationship.

In September 2011, data from Thohoyandou Health Centre and Tshilidzini Hospital showed that a total attendance of 730 (298 males and 432 females) patients visited their facilities for extractions (505 patients), fillings (95 patients) and minor surgeries (44 patients) but there were no data for pregnant women's attendance for dental care. According to dental therapists, pregnant women were reluctant to utilize dental care services during pregnancy. This is

perhaps due to ignorance on the part of pregnant women on the importance of utilizing oral care services during pregnancy; as such the study aims at looking at knowledge, attitude, practices and challenges regarding oral health among pregnant women in Thulamela.

1.3 Rationale for the study

Oral problems are risk factors associated with pre-term deliveries and low birth weight. It is therefore important to assess the knowledge, attitude, practices and challenges related to oral health in areas such as Thulamela Municipality. This is because Thulamela Municipality is located in a rural area and the vast majorities of the pregnant women living there have low education and are of poor socio-economic status.

1.4 Significance of the study

Stakeholders that will benefit from the outcome of this study include health policy makers with regards to a review of the government policy on maternal and child oral hygiene services. The findings of the study and recommendations should add value to the body of knowledge at large and assist in improving maternal health services.

1.5 Purpose

To assess the knowledge, attitude, practices and challenges regarding oral health among pregnant women attending antenatal clinics in Thulamela Municipality, Vhembe District, Limpopo Province in South Africa.

Objectives

- To assess the extent of knowledge of oral health among pregnant women attending antenatal clinics.
- To assess the attitude of the participants with regard to oral health-care in pregnancy.
- To describe the practices of oral health among selected pregnant women attending ante natal clinic.
- To assess the challenges faced by pregnant women regarding oral health.

1.6 Definition of terms

Oral Health- is a standard of health of the oral cavity and related tissues which enable an individual to eat, speak and socialize without active disease, discomfort or embarrassment and which contributes to general wellbeing (Carneiro, Kabulwa, Makyao, Mrosso & Choum, 2011) For the purpose of this study 'oral health' refers to being free from mouth diseases and pain, for example periodontitis and bleeding gums.

Pregnancy is the period from conception to birth. After the egg is fertilized by a sperm and then implanted in the lining of the uterus, it develops a placenta and becomes an embryo, and later into a fetus (Free online Dictionary, 2012). For the purpose of this study, pregnancy is the period when any woman is carrying a fetus or embryo inside her womb.

Pregnant woman is any woman carrying a fetus in the lining of her uterus. (Free online Dictionary, 2012). For the purpose of this study a pregnant woman will be defined as any women carrying a fetus in the lining of her uterus.

Premature babies according WHO (2010) are babies born before 37 weeks from the first day of the last menstrual period. For the purpose of this study a premature baby is a baby that is born before 37 weeks of gestation.

Knowledge is facts and information acquired through experience or education, or the theoretical or practical understanding of a subject (Oxford Dictionary, 2013). For the purpose of this study, knowledge is understanding of and information on oral health education and practices that pregnant women have.

Attitude is a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation (Business Dictionary). For the purpose of this study attitude include the views of the participants about oral health care in pregnancy.

Practice is repeated exercise in the performance of an activity or skill so as to acquire or maintain proficiency in it (Oxford Dictionary, 2013). In this study practice refers to what pregnant women do in order to keep their good status in oral health.

A challenge is something difficult which requires great effort and determination (Oxford Dictionary, 2013) in this study challenges refers to circumstances, situations or factors which prevent pregnant women from accessing dental care.

LITERATURE REVIEW

This section includes a review of the previous studies related to oral health in pregnancy and the model under-pinning this study. The researcher found that there is paucity of data with regards to oral health during pregnancy, especially in South Africa.

2.1 Data-based literature

2.1.1 Oral health in pregnancy

WHO defines oral health as a state of complete physical, mental and social well-being, not merely the absence of tooth decay, oral and throat cancer, gum disease and chronic pain (Beaglehole *et al.*, 2009). WHO recognizes oral health as an integral part of general health. Oral health and general health share common risk factors related to diet, the use of tobacco, the excessive consumption of alcohol and HIV (Peterson, 2004). Ninety percent of the global population has experienced oral or dental problems in their lifetime; these figures are staggering considering that most oral diseases are completely preventable. Yet, many people around the world do not have the benefit of oral health education because they lack access to an oral care provider who can help them learn the benefits of good preventive care (Wilder, 2011).

Several studies have been done globally and in the region investigating about the oral health status of pregnant women. According to Agbelusi, Akinwande & Shutti (2000), the mean oral hygiene index score increased progressively throughout pregnancy (1st trimester 0.72; second trimester 1.06; and third trimester 1.23). Community Periodontal Index of Treatment Needs (CPITN) revealed that of the population, 50% required scale and polish and oral hygiene instruction, 13.60% required oral hygiene instruction only and 32.2% did not require any treatment. People with teeth that were Decayed, Missing and Filled (DMF) recorded were 1.54. About 52% of pregnant women required amalgam fillings, 23.27% required extraction due to caries and 16.38% required partial dentures. These findings showed that the more pregnancy progressed, the more oral hygiene problems and the need for oral care, increased (Agbelusi *et al.*, 2000).

Taheri, Azimi, Mathew & Pisgah (2013), in a study comparing the periodontal status between pregnant and non-pregnant women, the outcome was that bleeding on probing and loss of attachment and simplified oral hygiene index is seen more in pregnant women than non-pregnant women. Therefore their study suggests that clinicians should recommend that women considering pregnancy have a periodontal evaluation and prophylactic treatment (Taheri *et al.*, 2013). In a similar study by Annan & Nuamah (2005) they indicate that there was a higher incidence of gingival bleeding or a worse score for pregnant women (89%) than non-pregnant women (61%). The commonest method of oral hygiene among both pregnant and non-pregnant women was a combination of chewing stick and toothbrush with paste. The second commonest method was chewing stick alone among the pregnant women and among the non-pregnant women tooth brushing with paste. The mean number of sextants with gingival bleeding among the second trimester pregnant women was consistently high (more than three) irrespective of the method of oral hygiene used. The level of gingival bleeding during pregnancy was not significantly affected by any of the methods of oral hygiene used ($p < 0.05$) which was higher during the second trimester compared with the third trimester of pregnancy (Annan & Nuamah, 2005).

2.1.2 Risk factors for oral diseases in pregnancy

Exposure to risk factors such as low socio-economic status, poor education, HIV infection, low dental care utilization, poor oral hygiene level, smoking, and psychosocial stress tend to concentrate in certain populations. These factors are more, or as important, as race and ethnicity (Wandera, Engebresten, Okullo, Tumwine & Astrom, 2009). According to Scannapieco, Bush & Paju, 2003 implicated periodontal diseases, as a risk factor for adverse pregnancy outcomes such as prematurity and low birth weight.

2.1.2.1 Tobacco/Cigarette smoking during pregnancy

Tobacco use is linked with many serious illnesses, such as cancer, lung and heart diseases, as well as numerous other health problems. Smokers are two to seven times more likely to develop periodontal diseases than non-smokers (Bountigny, Boschini & Delcourt-Debruyne, 2005). Smoking during pregnancy causes peri-natal morbidity and mortality and it is also associated with the risk of premature and low birth weight directly and via periodontal diseases (Bountigny *et al.*, 2005). Tobacco is also a risk factor for oral cancer, oral cancer recurrence and congenital defects, such as cleft lip and palate in children whose mothers

smoke during pregnancy (Petersen, 2003). A study by the American Academy of periodontology has found that there was a dose-response relationship between cigarettes smoked and the odds of getting periodontitis. For smokers who smoked more than ten cigarettes per day, they were found to be three times more likely to have periodontal disease than non-smokers. Smokers who smoked more than a packet to a packet and half of cigarettes per day were found to be six times more likely to have periodontal diseases than non-smokers (Tomar & Asma, 2000).

2.1.2.2 Low level of oral health education in pregnancy

Pregnancy is a particularly important time to promote oral health and healthy behavior, including education about the prevention of dental caries and gingivitis. Pregnant women with inadequate knowledge of dental health care and poor dental hygiene practices are two to three times more at risk of developing these dental diseases (Rakchanok, Ampron, Yoshida, Harun-Arun-Or-Rashid & Sankomoto, 2010). Boggess, Urlaub, Moos, Polinkovsky, El-Khorazaty & Lorenz, (2011) suggest in their study that oral health education as part of prenatal care was found to be a factor that may improve knowledge regarding the importance of oral health among vulnerable pregnant women, thereby improving their oral health. Information on oral care among pregnant women in African countries is scarce. For instance, in Nigeria, only 36.7% of pregnant women reported having received oral care information from a dentist (Orenuga & Sofola, 2005).

2.1.2.3 Oral manifestation of HIV/AIDS

Thorpe (2006) results of a study indicate that oral manifestations of HIV/AIDS were widespread and most commonly included fungal infections, such as those caused by candida, necrotizing gingivitis, or oral leukoplakia. The study on oral complications of HIV disease suggests that the prevention, diagnosis, treatment and control of oral manifestation should be part of the objectives for every dental health professional. It is therefore necessary to integrate continuous and careful medical care of oral health as part of the treatment for the people with HIV/AIDS (Leao, Rebeiro, Cavalho, Frezzini, & Potter, 2009).

Furthermore, oral candidacies and angular cheilitis were the most commonly seen oral lesions in these patients with a frequency of 78 (61%) and 51 (40%) respectively (Adeyemi,

Rudolph, Yusuf, McIntyre, Gray & Martison, 2006) prevalence of oral mucosal lesions, like candidacies, was also reported to be higher in pregnant than non-pregnant women (Saddki, Yusoff & Hwang, 2010).

2.1.2.4 Utilization of dental service during pregnancy

Common excuses given by most mothers include perceptions of not having any oral health problems (65.9%), long waiting times at the clinic (71.6%), and no immediate treatment given by the dentist (64.8%) (Saddki *et al.*, 2010). According to Al Habashneh, Guthmiller, Levy, Johnson, Squier, Dawson & Fang (2005) in their study on factors related to utilization of dental services during pregnancy, noted that dental visits during pregnancy were reported by 49% of respondents; factors identified as significantly associated with reporting dental visits during pregnancy were personal factors such as greater frequency of visiting the dentist before pregnancy, financial factors such as not having dental insurance and knowledge of the possible connection between oral health and pregnancy outcomes. However a study conducted by Le, Riedy, Weinstein, & Milgrom., (2009) suggested that stressors that include poor domestic relationships, personal finances, unemployment and dental-related issues such as negative perceptions of dental experience, attitude toward dental providers, importance or valuing of oral health, perceived ability to pay for care, time constraints, and dental providers and office staff's attitudes toward clients were identified as barriers to utilizing dental services. But the results showed that most women overcame stress or dental-related barriers to obtain care for 88% utilized dental services and 12% did not. Boggess *et al.*, (2010) in their study suggest that racial, ethnic and economic disparities are related to oral hygiene practices and dental service utilization during pregnancy.

2.1.2.5 Poor oral hygiene levels in pregnancy

Social determinants in oral health are also very strong. The prevalence of oral diseases is increasing in low- and middle-income countries, and in all countries, the oral disease burden is significantly higher among poor and disadvantaged population groups (WHO, 2012). Most oral diseases and conditions require professional dental care; however, due to limited availability or inaccessibility, the use of oral health services is markedly low among older people, people living in rural areas, and people with low income and education (WHO, 2012).

2.1.3 Knowledge of prevention and treatment of oral diseases in pregnancy



According to the WHO (2012), the burden of oral diseases and other chronic diseases can be decreased significantly by addressing common risk factors. These include:

- Decreasing sugar intake and maintaining a well-balanced nutritional intake to prevent tooth decay and premature tooth loss;
- Consuming fruit and vegetables that can protect against oral cancer;
- Stopping tobacco use and decreasing alcohol consumption to reduce the risk of oral cancers, periodontal disease and tooth loss;
- Ensuring proper oral hygiene and using protective sports and motor vehicle equipment to reduce the risk of facial injuries and safe physical environments.

Dental cavities can be prevented by maintaining a constant low level of fluoride in the oral cavity. Fluoride can be obtained from fluoridated drinking water, salt, milk and toothpaste, as well as from professionally-applied fluoride or mouth rinse. Long-term exposure to an optimal level of fluoride results in fewer dental cavities in both children and adults (WHO, 2012)

2.1.4 Relationship between knowledge and practice

Knowledge is based on scientific facts and universal truths (Launiala, 2009). According to Altindag, Connoier and Mocan (2010) there is weak relationships between increased level of education and improvement in health knowledge. However, a study assessing women's knowledge, experiences of dental health in pregnancy and examining their self-care practices, suggested that there was significant association between dental knowledge and practices with both education and socio-economic status, and that lack of knowledge about oral and dental health was strongly linked to women with lower education achievements and lower socio-economic backgrounds (Thomas, Middleton & Crowther, 2008).

According to Nwaiswelo and Masalu (2007) in a cross sectional study they conducted on Oral health knowledge and behaviour among pregnant women in Kyela District in Mbeya Tanzania, they found that only 3.7% of the participants reported having visited a dentist during pregnancy. Most of the participants had inadequate oral health knowledge although the majority of them were brushing their teeth daily. Likewise, most of the participants had

not received oral health education, and only a few of them reported having had dental visits. Al Habashneh *et al.*, (2005), in their comprehensive study suggested that there was limited knowledge of the possible relationships between oral health and pregnancy outcomes. Knowledge about dental problems that may arise during pregnancy is insufficient to guarantee a good threshold to oral health care for the mother hence the need to promote information programs and oral health training in the territory, mainly directed at health-care specialists (gynecologists, and obstetricians) and at pregnant women (Capasso, LaPenna, Carcione, Vestri, Polimeni & Ottolenghi, 2011).

According to Sofola (2010), an understanding of what constitutes the entity of oral health is through several measures and activities includes the acquisition of knowledge, especially on oral diseases and their prevention, acceptable oral health behaviors such as maintenance of good oral hygiene and non-harmful dietary practices, as well as utilization of available facilities. Wilder (2011), lists reasons for failure to implement effective strategies using evidence from clinical and laboratory studies. The reasons as lack of awareness leading to delayed treatment; the public and even some oral health care professionals lack awareness of the importance of oral health education and early therapy and the consequences of not treating oral diseases, the lack of appropriate oral health care systems and lack of qualified oral health care professionals, such as dental hygienists in developing countries as contributing to the problem. Many countries do not have any oral care, much less a dental hygienist. Much more needs to be done to expand the availability of dental hygiene programs throughout the world so that everyone on this planet has access to care. The conclusion is that there is lack of understanding about the benefits of integrating oral health education into programs designed to promote general health and prevent chronic diseases (Wilder, 2011).

2.1.5 Challenges regarding oral health among pregnant women

2.1.5.1 Service-related challenges

The prevalence of oral diseases varies by geographical region, availability and accessibility of oral health services. Peterson (2004) state that in many developing countries, access to any kind of oral health services is limited, and affected teeth are often left untreated or are extracted to relieve pain and discomfort. In addition, little is known about the use of dental services during pregnancy (Peterson, 2004). Most women do not access oral health care during pregnancy despite evidence that poor oral health can have an adverse impact on the health of a pregnant woman (Buerlein, Peabody & Santoro, 2010).

According to Harold, Sgan-Cohen & Mann (2000) the global state of access to dental care has been widely studied and generally found to be closely related to socio-economic disparities. The goal of oral "health for all" is still far in the distance, almost 30 years after the Alma-Ata declaration. This state of affairs is unacceptable, especially among developed countries (Harold *et al.*, 2007). A study conducted by Gaffield, Colley & Gilbert (2001) showed that most study participants did not go for dental care during pregnancy; amongst those who reported having a problem, 50 % did not get dental care.

2.1.5.2. Personnel-related challenges

Prenatal care providers are usually the first health professionals to consult with a pregnant woman on preparing for a healthy pregnancy, yet many of these health providers are unaware of the importance of oral health during pregnancy resulting in low priority given to dental care during pregnancy (Buerlein *et al.*, 2010). Oral health providers are limited in providing oral health care during pregnancy by their lack of understanding about its impact and safety. They withhold or delay treatment of pregnant patients because of fear of injuring the woman or the fetus (California Dental Association Foundation, CDAF, 2010).

2.1.5.3. Individual-related challenges

The barriers mostly reported during dental visits include difficulty in finding a dentist, lack of insurance, misconception about safety and appropriateness of dental care during pregnancy, and sporadic anticipatory guidance during prenatal care and financial ability (Mwangosi & Kiango, 2012). Factors associated with culture, demographics and early life experiences with oral health care contributes to beliefs and knowledge about the importance of oral health, oral hygiene, nutrition practices and health-seeking behavior during pregnancy (Berlin *et al.*, 2010). Factors for utilizing dental services during pregnancy were studied, and the extent of the mothers' knowledge regarding oral health during pregnancy and its effects on pregnancy outcomes. The results showed that factors associated with reporting dental visits during pregnancy were personal factors, financial factors and knowledge of the possible connection between oral health and pregnancy (Al Habashneh *et al.*, 2005).

2.1.5.4. Economic challenges

Social and economic disparities in health are evident in a variety of health outcomes, including oral health and oral-health-related quality of life. However, even women who have sufficient dental insurance coverage are often unaware of the importance of visiting a dentist during pregnancy and when planning to become pregnant (Buerlein *et al.*, 2010). In the African Region oral health is seen as a very low priority, for extreme poverty means that the limited resources available to the health sector are directed towards life-threatening conditions such as HIV/AIDS, tuberculosis and malaria (WHO, 2005).

2.1.5.5. Myths and beliefs as a challenge

According to Launiala (2009), beliefs refer to traditional ideas, which are erroneous from the biomedical perspective, and which form obstacles to appropriate behavior and treatment-seeking practices. Dinas, Achyropoulos, Hatzipantelis, Mavromatidis, Zepiridis, Theodoridis, Dovas, Tantanasis, Goutzioulis & Bontis, (2007), found that the majority of women believe that dental treatment during pregnancy might have a negative effect on pregnancy outcome and despite the increased prevalence of dental problems among pregnant women, few women seek dental services. This is attributed to women's erroneous beliefs that dental procedures during pregnancy are not safe (Dinas *et al.*, 2007).

2.2 Common oral problems in pregnancy

Pregnant women are an important target group for good dental care during and following pregnancy. They are very receptive to information and keen to do the best they can for their teeth and that of their coming babies (Felton, Chapman & Felton, 2009). Oral changes due to the complex physiologic alterations occurring in pregnancy are related to fluctuations in levels of estrogen and progesterone, leading to an increase in oral vasculature permeability and a decrease in host immune competence, thereby increasing susceptibility to oral infections. Rakchanok *et al.*, (2010) showed that the prevalence rates of gingivitis during pregnancy range between 30 and 100%, and that susceptibility to oral diseases and conditions can increase during pregnancy.

2.2.1. Dental Caries

Dental caries in pregnant women can be aggravated by frequent snacking, cravings for sweet foods and nausea. Some pregnant women dislike the taste of tooth paste; this can lead to reduction in frequency of tooth brushing resulting in dental caries (Felton *et al.*, 2009).

2.2.2. Pregnancy gingivitis

The prevalence of gingivitis during pregnancy varies from 30% to 100% (Leiff, Boggess, Murta, Jared, Madianos, Moss, Beck & Offenbacher, 2004). The accumulation of hormones in gingival tissues affects gingival vasculature, the local immune system and its reaction to dental plaque.

(Christoffers, Kreisler & Willershausen, 2003). The immunological changes during pregnancy on the other hand, is associated with reduced phagocytosis, altered lymphocyte response and depressed antibody production (Zeeman, Veth & Dennison, 2001). This causes the accumulation of dental plaque in a pregnant woman which easily results in gingivitis (Christoffer *et al.*, 2003). Nausea and hormonal changes aggravate gingivitis in pregnancy and the symptoms include bleeding during brushing, spontaneous bleeding when eating crisp foods, occasional irritation of the gums and halitosis (Felton *et al.*, 2009).

2.2.3. Periodontal infection

Periodontitis is inflammation of the supporting structures of the teeth and research has shown that untreated periodontal infection in pregnancy can result in pre-term labour, premature birth and low birth weight (Felton *et al.*, 2009). Periodontal disease is caused by gram-negative anaerobic bacteria. These bacteria are capable of producing a variety of chemical inflammatory mediators, such as prostaglandins, interleukins and tumour necrosis factor that can directly affect the pregnant woman (Practice Guidelines, 2006). Pregnancy is associated with depressed antibody production (Zeeman *et al.*, 2001) and microbial dental plaque is the initiator of periodontitis. The initiation process of periodontal disease mainly relies on the immunological response of the individual to the infection (Kinane & Bouchard, 2008).

2.3 Systemic causes

In their investigation, El-Gharib *et al.*, (2010) found a significant connection between periodontal disease and the incidents of premature labour. The bacteria in dental plaque are

the leading cause of gum diseases and bacterial plaque is formed about an hour after tooth-brushing. Its formation can, however, be prevented by regular tooth brushing, the use of dentifrices and dental education. Oral health is subject to a number of risk factors such, as high sugar consumption, poor nutrition, poor basic hygiene, tobacco use, HIV, hormonal changes associated with pregnancy, stress and socio-economic factors, in general, the link between gum diseases and systemic health is well established (Beaglehole *et al.*, 2009).

The study documenting the effects of hormones on the oral health of pregnant women suggested that 25–100% of these women experience gingivitis and up to 10% may develop more serious oral infection. Evidence suggests that oral infections, such as periodontitis during pregnancy, may increase the risk of pre-term or low birth weight deliveries (Offenbacher *et al.*, 2001). During pregnancy, a woman may be particularly amenable to disease prevention and health promotion interventions that could enhance her health or that of her fetus (Gaffield, Gilbert, Malvitz & Romaguera, 2001).

2.4 Measures taken to improve the situation or solve the problem

The WHO Regional Committee for Africa adopted a Regional Oral Health Strategy for the period 1999-2008. The aim of the strategy was to strengthen the capacity of member countries to improve community oral health by developing appropriate national oral health policies and implementation plans, with emphasis on the prevention, early detection and management of oral diseases (WHO, 2005). One of the major barriers to improvement of oral health in the African Region is the absence, in most countries, of a clear statement on oral health policy to guide its oral health activities (WHO, 2005). Internationally the WHO has tried to come up with actions for fighting this silent epidemic and the National Call Action to promote Oral Health in America reported that “no less than a silent epidemic of oral diseases is affecting most vulnerable citizens, poor children, the elderly, and many members of racial and ethnic minority groups”(NIH, 2003).

As a primary preventative measure, the American Dental Association (ADA) recommends that pregnant women eat a balanced diet and avoid refined sugars, brush their teeth thoroughly using fluoride toothpaste twice a day, floss daily and have preventive exams and cleanings during pregnancy. According to the ADA, annual exams and routine cleanings during pregnancy are perfectly safe and further recommend the second trimester as the safer trimester for dental treatment because the first trimester is the developmental stage for the baby (Pepin, 2011).

2.5 Model

2.5.1 Knowledge, Attitude and Practice (KAP) Model

Knowledge, attitude and practice (KAP) studies are highly focused evaluations that measure changes in human knowledge, attitudes and practices in response to a specific intervention, usually outreach, demonstration or education (Shah, Pamar, Ramkishan & Mehta, 2011). Knowledge, attitudes and practices (KAP) surveys are possibly the most frequently conducted studies in health-seeking behavior research (Hausmann-Muela, Ribera & Nyamongo, 2003). Such studies collect information on what is known, believed and done in relation to a particular topic (WHO, 2008). In a survey study about knowledge, attitude and practice of oral health in pregnant women, the KAP level of oral health was mainly affected by the level of education, occupation of the subjects, and occupation of their mates. Pregnant women were found to be deficient in oral health knowledge and had incorrect oral-health-caring behavior (Tang, Zhu, Wang & He, 2011).

2.5.1.1 Knowledge

Knowledge, Attitude and Practice studies tell us what people know about certain things and their understanding of any given topic (Kaliyaperumal, 2004). In this model the knowledge part is normally used to assess the extent of community knowledge about diseases, conditions and other types of knowledge, such as culture specific knowledge and knowledge related to health systems (Launiala, 2009). This model is embedded within the traditional focus of health education. It is a model with a positive vision of science, treating the behavioral change as a logical individual decision: an individual can be expected to change an unhealthy habit to a healthy habit in the light of information on the health benefits of that change (Smyth, Caamaño & Fernández-Riveiro, 2007). Knowledge is only factor influencing treatment-seeking practices, and in order to change behavior, health programs need to address multiple factors, ranging from socio-cultural to environmental, economical, and structural factors (Launiala, 2009).

2.5.1.2 Attitude

Attitude is how the subjects under study feel, which refers to their feelings towards the subject under study, as well as any preconceived ideas that they may have towards the subject

(Kaliyaperumal, 2004). In this regard this study seeks to assess the views of the participants under study about oral health services in antenatal clinics. Measuring of attitudes in KAP method has been criticized probably because of the substantial risk of falsely generalising opinions and that attitudes are interlinked with the person's knowledge, beliefs, emotions, and values, and they are either positive or negative. When confronted with a survey question, people tend to give answers which they believe to be correct or in general acceptable and appreciated. Sensitive topics are particularly demanding (Launiala, 2009).

2.5.1.3 Practice

Practice refers to the ways in which participants under study demonstrate their knowledge and attitude through their actions (Kaliyaperumal, 2004). The model considers individual factors as the principal determinants of disease, biological or behavioral (Smyth *et al.*, 2007). Health-seeking behavior or practice may differ from one person to the other. The choice of treatment depends on the severity of the symptoms. It is common for people to wait and see how the symptoms develop before deciding on the choice of treatment. Mild symptoms can be treated at home, and if it persists, one may visit a health centre, or relatives may seek treatment from a traditional healer (Launiala, 2009).

2.5.1.4 Strengths of the KAP Model

The strengths of the KAP model is attributable to characteristics, such as its easy design, quantifiable data, easy interpretation and concise presentation of results, generalisation of small sample of results to a wider population, cross-cultural comparability and speedy implementation (Launiala, 2009). According to WHO, (2008) this model can identify knowledge gaps, cultural beliefs, or behavioral patterns that may facilitate understanding and action, as well as pose problems or create barriers in practicing good oral care. It is a model with a positive vision of science, treating the behavioral change as a logical individual decision, in a sense that an individual can be expected to change an unhealthy habit to a healthy habit in the light of information on the health benefits of that change (Smyth *et al.*, 2007).

2.5.1.5 Weaknesses of KAP Model

Some researchers have criticized the KAP model for taking for granted that the data provided offers accurate information about knowledge, attitudes, and practices that can be used for program planning purposes (Launiala, 2009). The model may therefore be considered as not perfect in terms of practical application in health education, since it does not take into account the subject's environment and socio-cultural context (Smyth *et al.*, 2007).

3.2 Area of the study

Thulamela Municipality has an estimated population of 537 454 people. The municipality is situated 70 km east of Mafikeng, 180 km north east of Polokwane, the capital city of Limpopo Province in South Africa. Thulamela Municipality is further demarcated into Thulamela A and Thulamela B. The focus of the study will be Thulamela B which is further divided into 3 local areas which are Sibasa, Shagandima and William Eddie local areas.

Table 3.1: September 2011 Statistics of Antenatal visits for the Clinics under Thulamela B. Source: Vhembe District Department of Health (Clinical total 2140)

Sibasa Local Area		Shagandima Local Area		William Eddie Local Area	
Dangane Clinic	49	Dangane Clinic	55	Dangane Clinic	31
Fondwe Clinic	66	Lobosondo Clinic	96	Gordeni Clinic	25
Mbiwi Clinic	37	Mshagandima Clinic	29	Makonde Clinic	29
Murungoni Clinic	16	Mobogona Clinic	76	Mokula Clinic	52
Pfannani Clinic	129	Mokwabe Clinic	38	Sterkstroom Clinic	39
Pfingidi Clinic	92	Shagandima Clinic	27	Thondokh'ate Clinic	20
Sibasa Clinic	242	Tshikuku Clinic	96	Tshikuku Clinic	50
Tafiki Clinic	59	Tswaga Clinic	63	Vhadii Tshikuku Clinic	25
Thoboyandou Health Centre	325			William Eddie Health Centre	212
Total	1045	484		591	

METHODOLOGY

3.1 Study design

The approach of the study was quantitative and according to Dawson (2010) quantitative research generates statistics through the use of large scale survey, using methods such as questionnaires and structured interviews. The design used was cross-sectional and this method was chosen because it enables a researcher to collect data at one point in time (Akinsola, 2005).

3.2 Area of the study

Thulamela Municipality has an estimated population of 537 454 people. The municipality is situated 70 km east of Makhado, 180 km north east of Polokwane, the capital city of Limpopo Province in South Africa. Thulamela Municipality is further demarcated into Thulamela A and Thulamela B. The focus of the study will be Thulamela B which is further divided into 3 local areas which are Sibasa, Shayandima and William Eddie local areas.

Table 3.1: September 2011 Statistics of Antenatal visits for the Clinics under Thulamela B. Source: Vhembe District Department of Health (Grand total 2120)

Sibasa Local Area	Shayandima Local Area	William Eddie Local Area
Dzingahe Clinic 49	Dzwerani Clinic 55	Damani Clinic 31
Fondwe Clinic 66	Lwamondo Clinic 96	Gondeni Clinic 25
Mbilwi Clinic 37	Magwedzha Clinic 29	Makonde Clinic 29
Murangoni Clinic 16	Muledane Clinic 78	Mukula Clinic 52
Pfananani Clinic 129	Mulenzhe Clinic 38	Sterkstroom Clinic 39
Phiphidi Clinic 92	Shayandima Clinic 29	Thondotshivase Clinic 50
Sibasa Clinic 242	Tshisaulu Clinic 96	Tshiombo Clinic 50
Tshififi Clinic 89	Tswinga Clinic 63	Vhufuli Tshitereke Clinic 83
Thohoyandou Health Centre 325		William Eddie Health Centre 232
Total 1045	484	591

3.4.2 Sampling

3.4.2.1 Sampling of Clinics

Cluster sampling method was used and geographical clusters were chosen. In this study the clusters were formed by clinics in urban, semi-urban and rural areas of Thulamela local area B. The urban group consisted of the clinics that were situated in Thohoyandou town, the semi urban consisted of those clinics that were nearer to the town while the rural group was made up of those clinics that were far away from Thohoyandou Town.

Table 3. 2: September 2011 Statistics of Antenatal visits for the Clinics under Thulamela B Sampling Frame showing Clusters. Source: Vhembe District Department of Health (Grand total 2120)

Clinics in Town(Urban)	Clinics near Town(Semi-Urban)	Clinics away from town.(Rural)
T/ndou HealtCentre 325	Muledane Clinic 78	William Eddie health Centre 232
Shayandima Clinic 29	Tshififi Clinic 89	Vhufuli Thitereke Clinic 83
Sibasa Clinic 242	Dzingahe Clinic 49	Tshiombo Clinic 50
Mbilwi Clinic 37	Dzwerani Clinic 55	Thondotshivhase Clinic 50
	Magwedzha Clinic 29	Sterkstroom Clinic 39
	Tshisaulu Clinic 96	Mukula Clinic 52
	Tswinga Clinic 63	Makonde Clinic 29
	Lwamondo Clinic 96	Gondeni Clinic 25
		Damani Clinic 31
		Fondwe Clinic 66
		Murangoni Clinic 16
		Pfananani Clinic 129
		Phiphidi Clinic 92
		Mulenzhe Clinic 38
Total 633	555	932
Sample 101	88	148

Two clinics were randomly selected per cluster. The names of all the clinics per cluster were written on pieces of paper, the pieces with the names for urban cluster were put in a bowl in order to select two clinics, and the same was done for semi-urban and rural clusters. After the above procedure, two clinics were sampled from each cluster. Clinics selected from the urban cluster were Thohoyandou Health Centre and Sibasa Clinic, selected from semi-urban cluster were Tshififi Clinic and Tswinga Clinic and clinics selected from rural cluster were William Eddie Health Centre and Mukula clinic. The number of participants that were to participate in each selected clinic was calculated.

3.4.2.2 Sample

Table 3. 3: The Sample of participants attending anti-natal clinics in Thulamela B

Urban Cluster	Total	Number of Participants	Semi Urban Cluster	Total	Number of Participants	Rural Cluster	Total	Number of Participants
1.Thohoyandou Health Centre	325	58	3.Tshififi Clinic	89	52	5.William Eddie Health Centre	232	121
2.Sibasa Clinic	242	43	4.Tswinga Clinic	63	36	6.Mukula Clinic	52	27
Grand Total	567	101	Grand Total	152	88	Grand Total	284	148

3.4.3 Sampling of participants

A sample of 337 participants was randomly selected; 337 is 15.9% of the total population. The 15.9% of participants was selected from each cluster as shown in Table 2 above. During the day of administering the questionnaires only pregnant women who volunteered to participate at selected clinics, were given questionnaires to complete.

3.5 Research Instrument

A structured self-administered questionnaire was used to collect data and it comprised of close-ended questions. The questionnaire was developed in English (Appendix A) and translated into Tshivenda (Appendix B) in order to accommodate participants who are not literate in English.

The questionnaire had 5 sections as follows:

Section A: Socio Demographic information, such as age, marital status, level of education.

Section B: Knowledge of the participants about the importance of oral health during pregnancy.

Section C: Attitude of the participants about oral health in pregnancy and oral health services in antenatal clinics.

Section D: Oral health practice of pregnant mothers participating in this study.

Section E: Challenges that participant encounter in accessing oral health services.

3.6 Pre-testing of the instrument

The questionnaire was administered to 34 pregnant women which is 10 % of 337. They were not part of the sample that formed the study but were having the same characteristics as the actual respondents. This process is referred to as 'test of face validity' (Akinsola, 2005). The findings were that some questions did not measure Knowledge Attitude Practice and Challenges regarding oral health therefore some questions were removed and some were restructured.

3.6.1 Reliability

Test-retest reliability of the questionnaire was done on 10% of 337. Completed questionnaires were collected for analysis and arrangements were made with the same participants to come back to the clinic for retest. After two days as per arrangements the same participants returned to the clinic and the same questionnaire was administered. The findings were that the same results were produced by both questionnaires.

3.6.2 Validity

Validity of the questionnaire was checked whether it was successful in measuring what it purports to measure. The process of validation was done by consulting literature on other related questionnaires, consulting supervisors and experts in the field of oral health.

3.7 Data collection procedure

Prior arrangements were made with the clinics to invite the participants to come to the clinic on the agreed days. The researcher with the assistance of research assistance assembled participants in a comfortable place to complete the questionnaire. In the study 340 questionnaires were administered in all 6 selected clinics. Twenty five questionnaires were spoiled with gaps therefore 315 questionnaires were considered valid.

Those who were not able to read and write English or Tshivenda were assisted to complete the questionnaires. The questionnaires were completed there and collected immediately to reduce non-response.

3.8 Data analysis

Data was analysed using SPSS Version 19. Descriptive statistics such as frequency distribution and tables were used. In addition a Chi square test was used to check for statistical significance.

3.9 Ethical Considerations

3.9.1 Ethical clearance

The proposal was presented to the University of Venda Public Health Department, and then to the Higher Degree's Committee, School of Health Sciences. It was then sent to the Senex Committee for approval and to the University ethical clearance committee for final approval (Appendix F). Permission to conduct the study was sought from the Department of Health Limpopo (Appendix C) and approval was obtained from the Department of Health Limpopo (Appendix G) and Vhembe District and (Appendix H)

3.9.2 Beneficence

The principle of beneficence was applied in this study by ensuring that the participants' well-being is maximised. The research was beneficial as it created new knowledge and brought no harm to the participants.

3.9.3 Informed Consent

The purpose of the research was explained to the participants for them to give an informed written consent (Appendix D). The informed consent form was also translated to Tshivenda. Only those who completed the consent form were allowed to participate. Participants were also informed that participation is voluntary and that they may withdraw from the study at any time, if they so wish. For participants under the age of 18 years, consent was sought from their parents before they were allowed to participate according to South African law of full legal capacity.

3.9.4 Confidentiality

The participants were informed that their information was going to be treated with the highest confidentiality. As a measure of ensuring confidentiality, the questionnaires were not requiring participants to provide their names or identity number.

3.9.5 Autonomy

The participants were given full disclosure of the nature of the study, the benefits and an extended opportunity to ask questions before the data collection.

3.10 Limitations of the study

The results of this study should be interpreted with caution because the participants are rural based women attending local clinics where the facilities may not be up-to-date with oral health equipments. It is believed that the level of knowledge, attitude, practices and challenges of urban women regarding oral health care may be different.

The participants may not have been able to express their real opinions because the study used a close ended questionnaire which only allows them to answer direct questions without

making their own contribution. Therefore a qualitative approach may have added value to the study.

The study only focused on pregnant women in Thulamela B local municipality who were attending ante-natal clinics. Due to the small sample used the findings of the study could not be generalized to all pregnant women in South Africa.

3.11 Dissemination of results

The findings of the study will be presented to University of Venda School of Public Health and Limpopo Department of health. Dissemination includes making copies of the report available to the University of Venda library, conferences and in peer reviewed papers.

RESULTS

4.1 Introduction

This chapter presents the findings of the study. Interpretation of data was done using frequency tables and Pie charts while inference was drawn using chi-square test. The findings have been divided into four sections as follows; Section A: Socio-demographic characteristics of participants, Section B: Knowledge of the participants about the importance of oral health during pregnancy, Section C: Attitude of the participants about oral health in pregnancy and oral health services in antenatal clinics, Section D: Oral health practices of pregnant mothers and Section E: Challenges that participant encounter in accessing oral health services.

4.2. Socio-demographic characteristics of participants

A total of 315 women participated in this study, their age ranged between 15 to 44 years of age with a mean age of 25.1 year Standard Deviation (SD=5.8). As shown in Table 4.1, 47 (14.9 %) participants were between 15-19 years, 121 (38.4%) participants were between 20-24 years, 81(25.7%) were between 25-29 and 66 (21.0%) participants were aged 30 years and above.

One hundred and eight-two (57.8%) participants were single, 124 (39.4%) were married while 6 (1.9%) were divorced and 3 (1%) were widowed.

The level of education of this group of participants were high as only 13 (4.1%) of them did not go beyond primary education, 148 (47.0%) attended school up to secondary level and 154 (48.9%) highest level of education was tertiary education. In this study, tertiary education was defined as any qualification in addition to the matric. Majority (81.5%) of the participants was unemployed and their source of financial assistance was from boyfriend (12.7%), Parents (39.4%), husbands (33.3%) and other family members (2.2%).

Table 4.1: Demographic information of the respondents

Characteristics	n	%
Age		
15-19	47	14.9
20-24	121	38.4
25-29	81	25.7
30>	66	21.0
Total	315	100
Marital status		
Single	182	57.8
Married	124	39.4
Divorced	6	1.9
Widowed	3	1.0
Total	315	100
Level of education		
Primary	13	4.1
Secondary	148	47.0
Tertiary	154	48.9
Total	315	100
Employment status		
Yes	58	18.5
No	256	81.5
Total	314	100
Financier		
Boyfriend	40	12.7
Parents	124	39.4
Husband	105	33.3
Others	7	2.2
NA	39	12.4
Total	315	100

4.3 Background information on previous pregnancy

As shown in Fig. 4.1a, 163 (52%) participants were pregnant for the first time while 90 (29%) participants were pregnant for the second time. Thirty eight (12%) participants reported they were pregnant for the third time and 15 (5%) participants reported they were pregnant for the fourth time while 7 (2%) and 2 (1%) participants were pregnant for the fifth and sixth time respectively during the study.

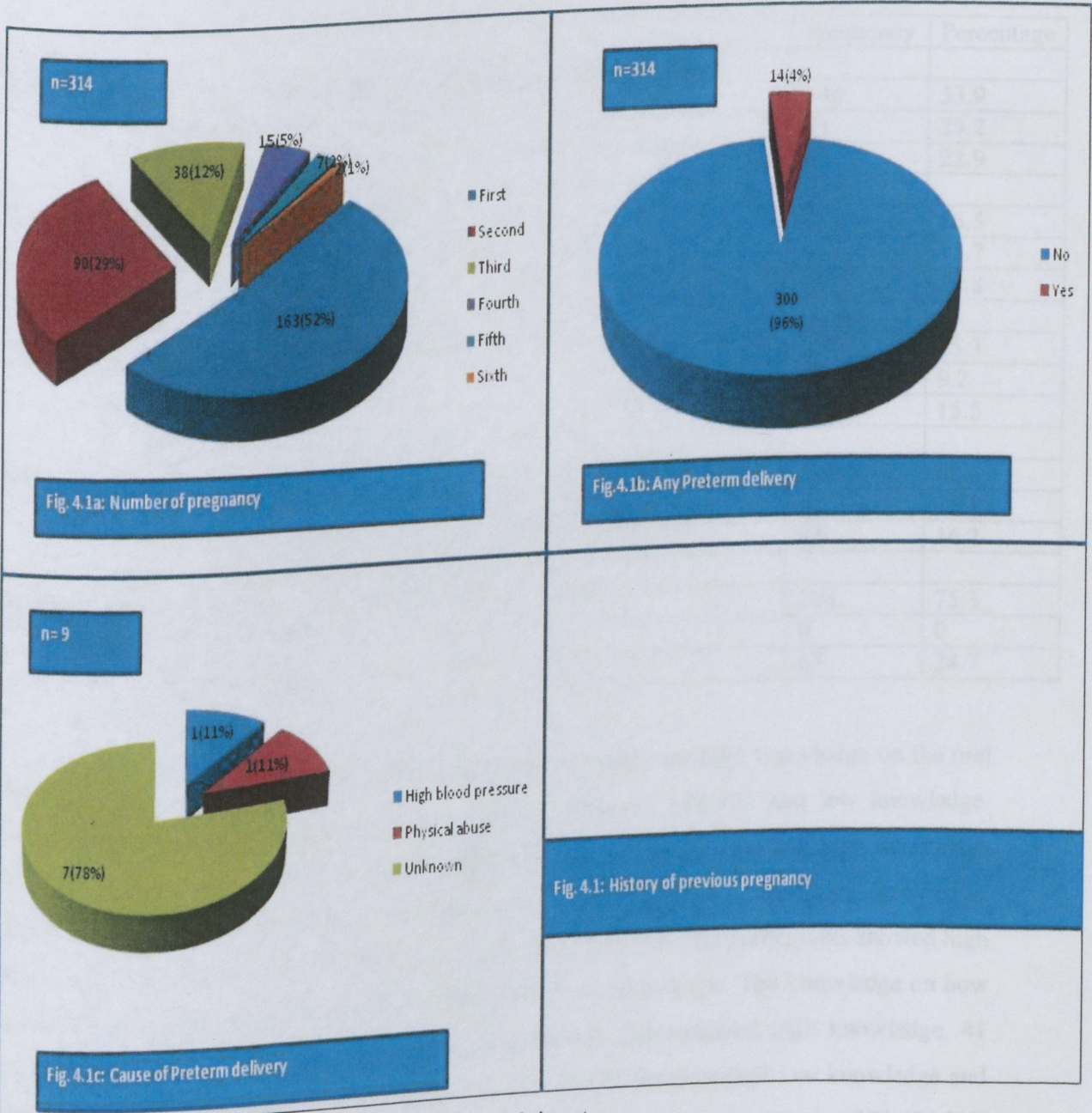


Figure 4. 1: the number of pregnancy for the participants.

4.4 Knowledge of the participants about the importance of oral health during pregnancy

Knowledge was assessed using multiple choice questions and scores were given based on correct or incorrect answers. A score of 0-1 =low knowledge; A score of 2=moderate knowledge and a score of 3-4 = high knowledge

Table 4. 2: Knowledge of oral health during pregnancy.

Variable	Frequency	Percentage
What are the oral health problems that can affect a pregnant woman	146	53.9
High knowledge	63	23.2
Moderate knowledge	62	22.9
Low knowledge		
Bleeding of the gum may result from	153	56.5
High knowledge	37	13.7
Moderate knowledge	81	29.8
Low knowledge		
What are the foods that cause tooth decay	204	75.3
High knowledge	25	9.2
Moderate knowledge	42	15.5
Low knowledge		
How can we improve oral health	186	68.6
High knowledge	41	15.1
Moderate knowledge	44	16.2
Low knowledge		
Bleeding during pregnancy can be avoided by	204	75.3
High knowledge	0	0
Moderate knowledge	67	24.7
Low knowledge		

As shown in Table 4.2, majority (53.9%) of the participants had high knowledge on the oral health problems that affect women in pregnancy while 62 (22.9%) had low knowledge. Regarding the cause of bleeding gum during pregnancy 153 (56.5%) had high knowledge while 81 (29.8%) showed low knowledge and 37 (13.7%) showed moderate knowledge. However with regards to foods that causes tooth decay 204 (75.3%) participants showed high level of knowledge while 42 (15.5%) demonstrated low knowledge. The knowledge on how oral health can be improved, 186 (68.6%) participants demonstrated high knowledge, 41 (15.1%) demonstrated moderate knowledge and 44 (16.2) demonstrated low knowledge and with regards to what can be done to avoid bleeding gums during pregnancy, 204 (75.3%) showed high knowledge and 67 (24.7%) showed low knowledge.

Table 4.3: Knowledge and Age of participants.

Variable	Age (in years)				Chi- square and p-value
	15-19	20-24	25-29	30>	
What are the oral health problems that can affect a pregnant woman					
High knowledge	20	55	38	33	$X^2=4.314$ $p=0.890$
Moderate knowledge	7	27	18	10	
Low knowledge	11	22	15	15	
Bleeding of the gum may result from					
High knowledge	21	70	33	29	$X^2=19.596$ $p=0.021$
Moderate knowledge	8	22	32	19	
Low knowledge	9	12	6	10	
What are the foods that cause tooth decay					
High knowledge	25	79	58	42	$X^2=6.389$ $p=0.700$
Moderate knowledge	7	17	9	9	
Low knowledge	6	8	4	7	
How can we improve oral health					
High knowledge	21	74	49	42	$X^2=9.697$ $p=0.376$
Moderate knowledge	7	16	15	6	
Low knowledge	10	14	7	10	
Bleeding during pregnancy can be avoided by					
High knowledge	26	75	59	44	$X^2=5.264$ $p=0.510$
Moderate knowledge	0	0	0	0	
Low knowledge	12	29	12	14	

As shown in Table 4.3, most of the variables showed no significant age difference in the level of knowledge across all age groups. The only variable with significant age difference in level of knowledge was the knowledge on the cause of bleeding of gums during pregnancy ($X^2=19.596$ $p=0.021$).

This result shows that the level of knowledge about oral health care during pregnancy was high. Although this indicates that the majority of participants demonstrated high level of knowledge, there was a significant difference across age group regarding the cause of bleeding gums during pregnancy.

Table 4. 4: Age and attitude of participants.

Table 4.5 shows no significant difference in attitude across age groups at $p < 0.05$.

Variable	Age (in years)				Chi- square and p-value
	15-19	20-24	25-29	30>	
Pregnancy increases oral problems					
Strongly disagree	12	35	24	18	$X^2=14.613$ $p=0.263$
disagree	23	44	24	22	
Agree	9	25	28	17	
Strongly agree	2	15	4	9	
Oral health services in clinic is good					
Strongly disagree	6	15	8	11	$X^2=9.866$ $p=0.628$
disagree	14	33	27	24	
Agree	19	44	36	23	
Strongly agree	7	27	9	8	
Antenatal clinic is well equipped for oral care					
Strongly disagree	7	13	9	7	$X^2=8.141$ $p=0.774$
disagree	16	37	28	25	
Agree	11	51	29	23	
Strongly agree	12	18	14	11	
Oral health education is offered					
Strongly disagree	8	20	16	5	$X^2=9.586$ $p=0.652$
disagree	17	49	31	28	
Agree	11	34	25	23	
Strongly agree	10	16	8	10	
Dental therapy is safe during pregnancy					
Strongly disagree	7	22	12	10	$X^2=10.433$ $p=0.578$
disagree	18	30	28	27	
Agree	13	46	26	24	
Strongly agree	8	21	14	5	
An unborn baby is not affected by poor oral care					
Strongly disagree	8	20	14	10	$X^2=8.710$ $p=0.727$
disagree	14	49	24	25	
Agree	20	32	32	24	
Strongly agree	4	18	10	7	
Oral health exam is always done during antenatal					
Strongly disagree	10	28	14	17	$X^2=10.730$ $p=0.552$
disagree	16	42	41	29	
Agree	12	35	17	16	
Strongly agree	8	14	8	4	

4.6 Practices of participants regarding oral health

Fig. 4.2a shows how often participants visit the dentist, about a quarter of the participants do not visit the dentist at all, almost one out of every five visit the dentist on a six monthly basis while 16.6% visit the dentist only once a year. The majority of the participants (38.7%) visit the dentist only when there is a need.

Fig. 4.2b: Indicates how often participants brush their teeth. The results show that 110 (35.1%) of the participants brush their teeth once a day while 202 (64.5%) of the participants brush their teeth twice a day and 1(0.3%) participant does not brush her teeth everyday.

As shown in Fig. 4.2c, majority (50.2%) of the participants brush their teeth twice a day (in the morning and at night), 39 (12.5%) participants brush their teeth after eating, 14 (4.5%) participants brush their teeth before eating while 103 (32.9%) participants brush their teeth in the morning only.

Fig. 4.2d shows that 206 (65.8%) participants reportedly changed their toothbrush after 6 months while 65 (20.8%) of them change their toothbrush after 12 months and 42 (13.4%) change their toothbrush longer than 12 months. This study also found that 193 (61.7%) participants use soft bristle toothbrush, while 119 (38%) use a hard bristle toothbrush and 1 (0.3%) participant does not use toothbrush at all (as shown in Fig. 4.2e).

Fig. 4.2f shows that the majority (66.8%) of the participants would visit the clinic when they have dental problems while 60 (19.2%) participants would ignore the pain and 43 (13.7%) would self-medicate at home.

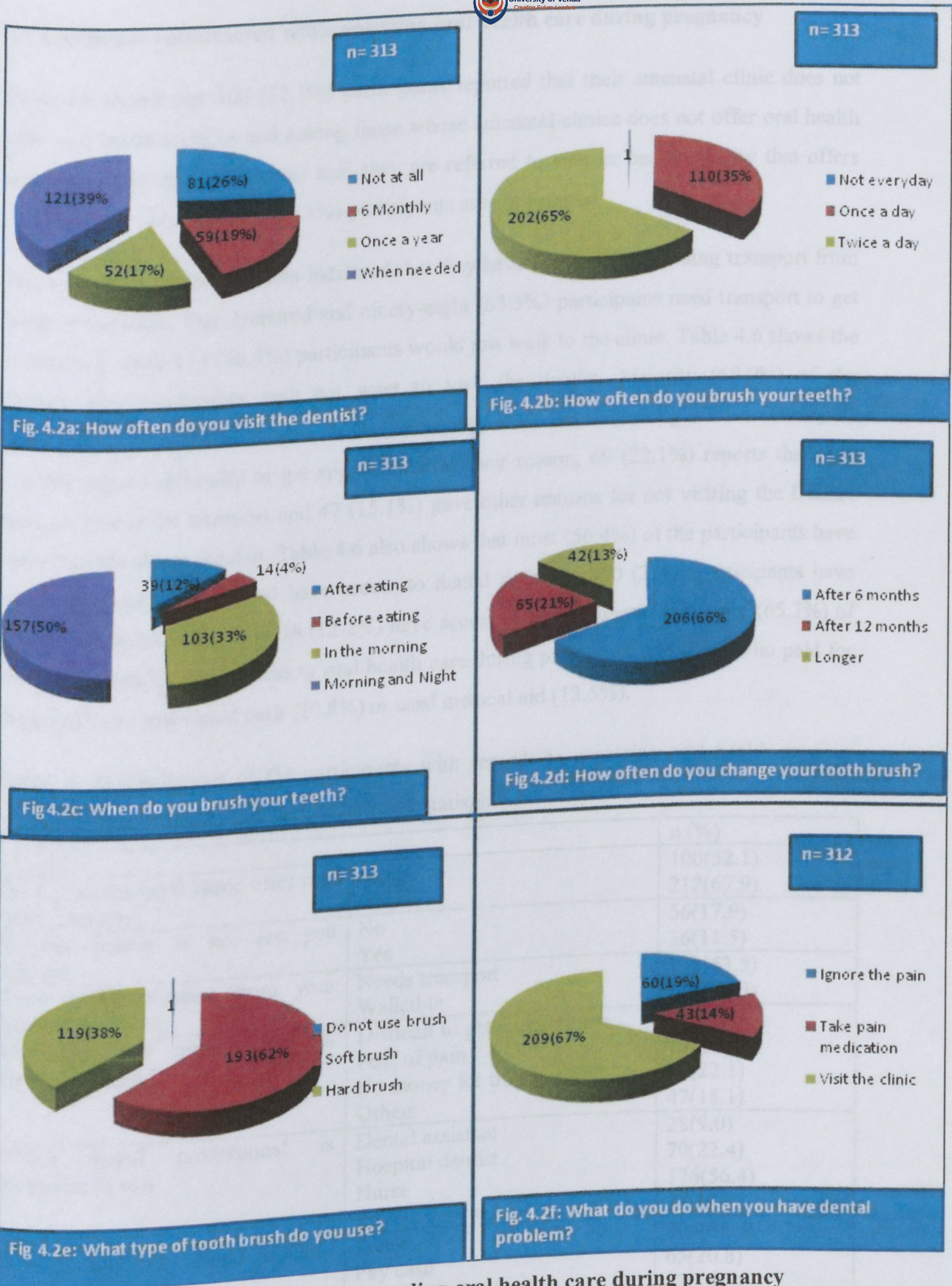


Figure 4. 2: Practices of participants regarding oral health care during pregnancy

4.7 Challenges encountered while accessing oral health care during pregnancy

Table 4.6 shows that 100 (32.1%) participants reported that their antenatal clinic does not offer oral health services and among those whose antenatal clinics does not offer oral health services, 56(60.9%) participants said they are referred to another health facility that offers oral health services while 36(39.1%) participants are not referred.

The majority of the participants indicated that they have challenges accessing transport from home to the clinic. One Hundred and ninety-eight (63.5%) participants need transport to get to the clinic while 114 (36.5%) participants would just walk to the clinic. Table 4.6 shows the reasons why participants may not want to visit the dentist. Majority (60.0%) of the participants reported fear of pain as the main reason for not consulting with a dentist, 37 (11.9%) reports difficulty to get appointment as their reason, 69 (22.1%) reports that they have no money for transport and 47 (15.1%) gave other reasons for not visiting the Dentist other than the above reasons. Table 4.6 also shows that most (56.4%) of the participants have access to a nurse, 28 (9.0%) have access to dental assistants, 70 (22%) participants have access to hospital dentist and 38 (12.2%) have access to private dentist. Majority (65.7%) of the participants had free access to oral health care during pregnancy and those who paid for dental services either paid cash (20.8%) or used medical aid (13.5%).

Table 4. 5: Challenges of the participants with regards to accessing oral health services during pregnancy interpreted with descriptive statistics.

Variable	n (%)
Does your antenatal clinic offer oral health services	100(32.1) 212(67.9)
If your answer is no, are you referred	No 56(17.9) Yes 36(11.5)
What is the distance from your home to the clinic	Needs transport 198(63.5) Walkable 114(36.5)
What are your reasons for not visiting a dentist	Difficult to get appointment 37(11.9) Fear of pain 159(60.0) No money for transport 69(22.1) Others 47(15.1)
Which dental professional is accessible to you	Dental assistant 28(9.0) Hospital dentist 70(22.4) Nurse 176(56.4) Private dentist 38(12.2)
Do you pay for dental services during pregnancy	Free 205(65.7) Pay cash 65(20.8) Use medical aid 42(13.5)

DISCUSSIONS

5.1.1 Socio-demographic characteristics of participants

A total of 315 women participated in this study, their age range was between 15 to 44 years with a mean age of 25.1 years (SD=5.8). Majority (38.4%) of the participants were between the optimal child bearing ages (20-24 years). The mean age of participants in this study is lower than that in two similar studies conducted in Nigeria (Adeniyi et al., 2011) and Australia (Thomas et al., 2008) where majority of the participants were likely to be 30 years and above. This suggests that women in the present study were younger at the time of pregnancy and are also more likely to be unemployed and as a result, become financially dependent on their parents, boyfriends and relatives. This is shown in Table 4.1.

Studies on the effects of oral infections on pregnancy have presented evidence to show that there is an association between oral infection during pregnancy and preterm deliveries (Offenbacher et al., 2001). Although the present study did not seek to establish the relationship between oral infection and preterm deliveries, the participants were asked if they had any history of preterm deliveries. Fourteen (4%) participants reported preterm delivery and for the majority, the cause was largely unknown. One participant reported physical abuse and another participant said her preterm delivery was as a result of hypertension in pregnancy. Generally, the prevalence of preterm delivery has been put at 5% in developed countries and as high as 25% in developing countries (Steer, 2005) but prevalence of preterm birth as a result of oral infection is between 3.3% and 6.3% (Jeffcoat et al., 2003).

5.1.2 Knowledge of the participants about the importance of oral health during pregnancy

Inadequate knowledge regarding the effect of dental and oral infections on pregnancy and child birth is a risk factor for developing dental diseases which may result in untoward pregnancy outcomes. Pregnant women with inadequate knowledge of oral health have been shown to be two to three times more at risk of developing dental diseases (Rakchanok et al., 2010). Therefore, improving the level of oral health knowledge during pregnancy is important to help women make informed choices to improve pregnancy outcomes. Although

some studies have shown low level of knowledge on oral infections (Bogges et al., 2011) and the possible relationship between oral health and pregnancy outcomes (Al Habashneh et al., 2005; Mwaiswelo & Masalu, 2007), the present study shows that participants have an overall high knowledge on the oral health conditions that affect women during pregnancy, most of them could identify conditions that affect women in pregnancy, and majority of them also knew how oral health could be improved during pregnancy. This may be as a result of the high level of education of the participants and this high level of knowledge would increase the acceptability of health promotion strategies in the future.

The high level of knowledge shown in the present study cuts across all the age groups and across all the parameters on which knowledge was tested with no significant age difference across all age groups. The only variable with significant age difference in level of knowledge was the knowledge on the cause of bleeding gums during pregnancy ($X^2=19.596$ $p=0.021$). The reason for this difference is not clear and needs to be investigated.

5.1.3 Attitude of the participants towards oral health

The attitude of an individual or the views expressed by an individual may predispose them to untoward health outcomes, and having a positive attitude towards utilizing the health facility and the services provides and brings an individual closer to making use of such facility. The present study found that slightly more than half of the participants have a positive view of the state of the dental facility and the services provided in the antenatal clinic they attend, this may be as a result of the different location of clinics used in this study. Those participants in the clinics located in the rural areas may not have access to dental facilities and some of them are also not referred. This positive outlook towards oral health facility may have been influenced by the level of education of these participants. However, a similar study conducted in Nigeria suggests that the level of knowledge and positive attitude towards oral health care may not always result to positive oral and dental practices (Adeniyi et al., 2011).

It has been shown that pregnancy may predispose or aggravate underlying oral or dental condition but in its self not an established cause of oral or dental disease (Laine, 2002). In the present study, just above three out of every five of the participants believes the contrary. This implies that they do not believe that a pregnant woman needs oral care during pregnancy and by the stroke of this, they may not pay attention to good oral and dental practices during pregnancy.

Oral health education is an important part of general health care (Peterson, 2004), the need for oral health education is crucial as about 90% of the world population has experienced one form of oral or dental problem in their lifetime. Many people around the world do not have access to oral health education because they lack access to oral care provider (Wilder, 2011). Oral health education is particularly important in pregnancy because of the effect pregnancy may have on oral and dental disease if optimal oral hygiene is not maintained (Agbelusi et al., 2000). The availability of oral health education was not evenly distributed in this study; it is the view of more than half of participants that adequate health education is not provided. Hence, about half of the participants are ill informed regarding the safety of dental therapy and oral examination during pregnancy and the effects of oral and dental diseases on the outcome of the pregnancy. Hence, in a study conducted in Nigeria about a third of pregnant women reported having received oral care information from a dentist (Orenuga & Sofola, 2005).

5.1.4 Practices of participants regarding oral health.

Dental visit is poor among participants in the present study despite their high level of education. About a quarter of the participants do not visit the dentist at all and the majority only visits a dentist when there is a need. This shows that the high level of oral health knowledge and high level of education displayed among the participants in this study has not influenced their practice. Similarly, Adeniyi et al. (2011) reports that 37.1% of their participants never visited a dental facility.

According to the American Dental Association (ADA) it is recommended that pregnant women brush their teeth twice a day (Pepin, 2011) because of the increased secretion of gestational hormones (especially oestrogen and progesterone) during pregnancy that allows swelling of the gums and provide a nesting place for microorganisms that would cause oral infection (Adeniyi et al., 2011). The present study finds that almost two out of every three participants brush their teeth twice a day, this is in accordance with the recommendation of the ADA and this could improve oral health outcomes for the participants. The remaining third of the participants who do not brush according to the ADA recommendation may be lacking in oral health knowledge regarding the benefits of brushing more regularly during pregnancy.

The period of time a toothbrush is used is considered important, a toothbrush will experience wear and tear as it is been used, when used for a prolonged period of time the bristles will

become worn-out and the brush would lose its mechanical effectiveness. Therefore, it is recommended that toothbrushes be changed every three to four months (CDC, 2013). The present study found that about a third of the participants used their toothbrush longer than six months and at this point, the toothbrush is not effective in maintaining dental hygiene and if the bristle is hard, it may further cause irritation to the gum. Although there is no consensus on the perfect type of toothbrush but it has been suggested that a toothbrush with a soft bristle may be better for an individual who brushes frequently because brushes with hard bristles may result in gum irritation when used frequently (Salmeri, 2010). Relating this to the present study, about a third of the participants use hard bristled toothbrush and this may lead to gum irritation and eventual swelling if they brush frequently as it is expected during pregnancy.

The present study also found that majority of the participants would visit the clinic when they have dental problems. This is a good practice as it will afford them an opportunity to get prompt attention rather than presenting late when no help can be rendered by the medical professional.

5.1.5 Challenges encountered while accessing oral health care during pregnancy

The availability and accessibility of oral health services varies with geographical area and it is more difficult to access oral health services in developing countries. Reasons have been put forward to explain why women do not access oral health care during pregnancy. In the present study, a third of the participants have no oral health services in the antenatal clinic they attend and two out of five of them are not referred and eventually they do not get access to any form of oral health care during pregnancy. This finding is supported by Peterson (2004) who states that the access to oral health care is limited in developing countries.

A lot of factors have been suggested as the reason for not accessing oral health services; the present study found that the most reported challenge in access of oral health services was distance to the clinic. Two out of every three participants need transport to get to the dental clinic, in the event that they do not have enough money for transport to get to the clinic, they may decide not to go. This is unlike those who stay close to the clinic and can easily walk down to the clinic. Fear of pain is also reported as a major factor preventing women from accessing oral health care and the less reported factors include difficulty to get appointment to see the dentist, and insufficient money for transport. It is important to note that antenatal care is generally free at the Primary Health Clinic (PHC) but some women prefer private clinics where they are charged fees. As shown by the present study, one out of every five

participants paid cash for oral services. Similar to the present study, other studies on the challenges in accessing oral health care have also reported service access related difficulty (Peterson, 2004) socio-economic related problems (Buerlein, Peabody & Santoro, 2010; WHO, 2005).

The present study found that the dental professional easily accessible to the participants is the nurse and the reason for this is that antenatal services are offered at the PHC and nurses are easily accessible to the women. It is therefore important to ensure that nurses at the PHC are adequately trained to attend to the oral health needs of pregnant women.

5.2 CONCLUSION

In conclusion, this study found a high unemployment rate as only one out of five participants was employed but this may not represent the true picture of the rate of unemployment in South Africa because the sample was drawn from only pregnant women residing in a rural community with few industries and the rate of preterm birth as reported by the participants was only 4% and this is within acceptable limits.

Most of the participants could identify oral health conditions that affect women in pregnancy and majority also knew how oral health could be improved. The present study also found that participants had high knowledge on the causes of bleeding gums during pregnancy as well as how it can be avoided. The high level of knowledge shown in the present study cuts across all the age groups and all the parameters on which knowledge was tested. The level of knowledge found in this study shows that participants are likely to seek medical help if it is available and could also increase the acceptability of health promotion programs in the future. However, the high level of knowledge found does not translate to good oral health practices.

Regarding attitude towards oral health, some of the participants had negative views about the quality of oral health services and the availability of equipment for oral care in their clinic. The majority of the participants do not believe that there is an association between pregnancy and poor oral care. It was also found that the availability of oral health education was not evenly distributed in this study; it is the view of more than half of participants that adequate health education was not provided. Hence, about half of the participants were ill informed regarding the safety of dental therapy and oral examination during pregnancy and the effects of oral and dental diseases on pregnancy outcomes. This implies that they do not believe that

a pregnant woman needs oral care during pregnancy. In the stroke of this, they may not pay attention to good oral and dental practices during pregnancy.

Dental visit was poor among participants in the present study despite their high level of education. This shows that the high level of oral health knowledge and high level of education displayed among the participants in this study has not influenced their practice. The present study also found that majority of the participants would visit the clinic only when they have dental problems. This is a good practice as it will afford them an opportunity to get prompt attention rather than presenting late when no help can be rendered by the medical professional.

Oral health services were not available in some antenatal clinics and majority of them reported distance from clinic and fear of pain during dental procedure as the major challenge in accessing oral health services. This may account for the low clinic attendance shown in this study. In addition, it was found that the dental professional that was easily accessible to the participants were nurses. It is therefore important to ensure that nurses at the PHC are adequately trained to attend to the oral health needs of pregnant women.

5.3 RECOMMENDATIONS

1. The Government should review their policies on oral health education and ensure that they evaluate these policies from time to time. This will help in developing a program to check whether the pregnant women are practicing what they have learnt.
2. Oral health professionals should deliver comprehensive oral health education to pregnant women attending antenatal clinics in order to correct their negative views with regards to oral health care during pregnancy.
3. The Department of Health should collaborate with Non-Government Organization (NGO) and the Community to increase oral health campaigns using print and electronic media as well as Community leaders to teach the importance of oral health in pregnancy.
4. The Government should equip oral health services in local antenatal clinic so that pregnant women will utilise nearby clinics to avoid in other to avoid the cost of transportation from home to clinic.

- Adeyemi, L.A.O., Rudolph, M.J., Yusuf, A.O., McIntyre, J.A., Gray, G.E. & Martinson, N., 2006, Oral Manifestations of HIV in Pregnant Women Attending Antenatal Clinics in JHB viewed 12.06.2012 from http://www.hivdent.org/_oralmanifestations_5thWorldWorkshopOnOralHealthAndDiseaseInAIDS/5WVOHDA-OMHPWAACJ.htm on 12/6/2012.
- Admin 2011, 'Pregnancy Gingivitis Symptoms' Viewed from <http://pregnancy.vgoy.com> on 10/09/2012.
- Agbelusi, G.A., Akinwande, J.A. & Shutti, Y.O., 2000, 'Oral health status and treatment needs of pregnant women in Lagos State', *The Nigerian Postgraduate Medical journal*, 7(3):96-100.
- Àgueda, A., Echeverría, A. & Manau, C., 2008, 'Association between periodontitis in pregnancy and preterm or low birth weight: Review of the literature' *Medicina Oral Patologia Oral Cirugia Bucal*, 13 (9):E609-615.
- Akinsola, A.H., 2005, *Research Methods in Medical and Nursing Practice*, (1st Edition). Nigeria College Press and Publishers limited.
- Al Habashneh, R., Guthmiller, J.M., Levy, S., Johnson, G.K., Squier, C., Dawson D.V. & Fang, Q., 2005, 'Factors related to utilization of dental services during pregnancy' *Journal of Clinical Periodontology*, 32(7):815-821.
- Altindag, D.T., Cannonier, C. & Mocan, N.H., 2010, 'The Impact Of Education On Health Knowledge' viewed from http://www.nber.org/papers/w16422.pdf?new_window=1 on 09/03/2013.
- Amar, S. & Chung, K.M., 1994, 'Influence of hormonal variation on the periodontium in women' *Periodontol*, 6:79-87.
- American Academy of Periodontology: Smoking and Periodontitis. (2012). viewed from <http://www.dentalarticles.com/authors/15.php> on 16.06.2012.
- Annan, I. & Nuamah, K., 2005, 'Periodontal status and oral hygiene practices of pregnant and non-pregnant women' *Ghana Medical Journal* 39(1): 24-27.

Beaglehole, R., Benzian, H., Crail, J. & Mackay, J., 2006, 'The Oral Health Atlas: Mapping a neglected global health issue. Geneva: FDI World Dental Federation' viewed from <http://www.fdiworldental.org/oral-health/atlas/mapping-a-neglected-global-health-issue.aspx> on 23/11/2011

Bogges, K.A., Urlaub, D.M., Moos, M.K., Polinkovsky, M., El-Khorazaty, J. & Lorenz, C., 2011, 'Knowledge and beliefs regarding oral health among pregnant women' *Journal of the American dental association*. 142(11):1275-1282.

Bountigny, H., Boschin, F. & Delcourt-Debruyne, E., 2005 'Periodontal diseases, tobacco and pregnancy' *Journal of Gynecology, Obstetric, Biology and Reproduction*, 1(3) :74-83

Bradshaw, D., Bourne, D. & Nannan, N., 2003, 'What are the leading causes of death among South African children' viewed on http://www.unicef.org/southafrica/SAF_publications on 24/06/2012.

Buerlein, J., Peabody, H. & Santoro, K., 2010, 'Improving access to perinatal oral health care: Strategies and considerations for health plans' Retrieved from http://www.cdhp.org/resource/improving_access_perinatal_oral_health_care_strategies_considerations_health_plans on 13/10/2012

Building a Future for Women and Children the 2012 Report. <http://www.countdown2015mnch.org/documents/2012Report/2012-part-2> on 08.06.2013

CDC. (2013). The Use and Handling of Toothbrushes <http://www.cdc.gov/oralhealth/infectioncontrol/factsheets/toothbrushes.htm>

California Dental Association Foundation, 2010, 'Oral health during pregnancy and early childhood: Evidence-based guidelines for health professionals' Sacramento, CA: California Dental Association Foundation. Retrieved from http://www.cdafoundation.org/Portals/0/pdfs/poh_guidelines.pdf on 12/04/2011

Campbell, C., 1997, 'Migrancy, masculine identities and AIDS: the psychosocial context of HIV transmission on the South African gold mines' *Social science and medicine*, 45 (2): 273-281.

Capasso, F., LaPenna, C., Carcione, P., Vestri, A., Polimeni, A. & Ottolenghi, L., 2011, 'Oral health and pregnancy: promotion of oral health during the pre-natal training in the Latina province' *Annali di igiene: medicina preventiva e di comunita*, 23(2):137-145.

- Carneiro, L., Kabulwa, M., Makyao, M., Mrosso, M. & Mnyami, M., 2011 'Oral Health Knowledge and Practices of Secondary School Students, Tanga, Tanzania' (2011), 806258, (6)
- Carnie, T., 2004, 'Article on Unintended consequences of fluoridated water' Retrieved from <http://www.fluoridealert.org/Alert/South-Africa/Unintended-consequences.aspx>. On 11/11/2004,
- Carpenter, W., Glick, M., Nelson, S.R., Rosa, S.M. & Patton, L.L., 2006 'Women's Oral Health Issues by the American Dental Association's Council on Access, Prevention and Interprofessional Relations (CAPIR)' Retrieved from http://www.ada.org/sections/professionalResources/pdfs/healthcare_womens.pdf on 27/09/2012
- Chikte. U.M.E., 2009, 'World Water Day - Water, water everywhere and not a drop to drink' *South African Dental Journal* 64 (2):50
- Clarkson, J.E., Young, L., Ramsay, C.R., Bonner, B.C. & Bonetti, D., 2009 'How to Influence Patient Oral Hygiene Behaviour Effectively' *Journal of Dental Research*, 88(10): 933-937.
- Cobban S.J., Edgington E.M. & Clovis J.B., 2008 'Moving research knowledge into dental hygiene practice' *Journal Dental Hygiene* 82(2): 21
- Christoffers, A.B., Kreisler, M. & Willershausen, B., 2003 'Effect of estradiol and progesterone on the proliferation of human gingival fibroblasts' *European Journal of Medical Research*, 8(12):535-542.
- Dawson, C., 2010 'Introduction to Research Methods a practical guide for anyone undertaking a research project' (Fourth Edition), How To Books Publishing.
- Dinas, K., Achyropoulos, V., Hatzipantelis, E., Mavromatidis, G., Zepiridis, L., Theodoridis, T., Dovas, D., Tantanasis, T., Goutzioulis, F. & Bontis, J., 2007 'Pregnancy and oral health: utilisation of dental services during pregnancy in northern Greece' *Acta Obstetrica et Gynecologica Scandinavica*, 86(8):938-944.
- El-Gharib, M.N., Nassar, M.M., Elabyary, M.T., Elhawary, T.M. & Elshourbagy S.H., 2010 'The link between Periodontal Diseases, Inflammatory Markers and Preterm Low Birth Weight Infants' *Clinical Medicine Insights: Reproductive Health*: 423-428.

Felton, A., Chapman, A. & Felton, S., 2009 'Basic Guide to Oral Health Education and promotion' (First Edition), USA: Willey-Blackwell Publishing.

Gaffield, M.L., Gilbert, B.J. Malvitz, D.M & Romaguera, R., 2001 'Oral health during pregnancy: An analysis of information collected by the Pregnancy Risk Assessment Monitoring System' *Journal of the American Dental Association*, 132(7):1009–1016.

Glanz, K., Lewis, F.M. & Rimer, B., 1997 'Health Behaviour and Health Education' 2nd edition. San Francisco: Jossey-Bass publishers.

Hausmann-Muela, S., Ribera, J.M. & Nyamongo, I., 2003 'Health-seeking behaviour and the health system response' Retrieved from <http://www.dcp2.org/file/29/wp14.pdf> on 21/07/2012.

Health Community, 2011 'Article on Pregnancy Gingivitis Symptoms' Retrieved from <http://pregnancy.ygoy.com/pregnancy-gingivitis-symptoms> on 10/09/ 2011.

Jeffcoat, K.M., Hauth, J. C., Geurs, N.C., Reddy, M. S., Cliver, S.P., Hodgkins, P.M, Goldberg, R.L. ,2003 'Peridontal disease and preterm birth: Results of a pilot intervention study' *Journal of Periodontol* 74 (8)

Johnston, B. & Shoreline, W. A., 2007 'Is Fluoride in Water Beneficial for Dental Health?' *Earth Talk*: June 25, 2007. <http://www.alternet.org/story/55161/earthtalk%3A> on 22/11/2012

Kaliyaperumal, K., 2004 'Guideline for Conducting a Knowledge, Attitude and Practice (KAP) Study' *Journal of arrived eye care system*, 4(1): 7-9.

Keirse, M.J. &Plutzer, K., 2010 'Women's attitude to and perception of oral health and dental care during pregnancy' *Journal for perinatal medicine*, 38(1):3-8.

Kinane, D. & Bouchard, P., 2008 'Periodontal diseases and health: Consensus Report of the Sixth European Workshop on Periodontology' *Journal of Clinical Periodontology*, 35(8):333–337.

Laine, M.A., 2002 'Effect of pregnancy on periodontal and dental health' *Acta Odontol Scand* 60(5):257-64

Launiala, A., 2009 'How much can a KAP survey tell us about people's knowledge, attitudes and practices? Some observations from medical anthropology research on malaria in pregnancy in Malawi' *Anthropology Matters Journal*. 11(1): 1-10.

Lawn, J.E., Gravett, M.G., Nunes, T.M., Rubens, C.E. & Stanton, C., 2010 'Global report on preterm birth and stillbirth (1 of 7): definitions, description of the burden and opportunities to improve data' *Biomedical Central, Pregnancy and Childbirth*, 10(1):S1.

Le, M., Riedy, C., Weinstein, P., & Milgrom, P. 2009 'Barriers to utilization of dental services during pregnancy: a qualitative analysis' *Journal of Dentistry for Children (Chicago)*.76(1):46-52

Leao, J.C., Rebeiro, C.M.B., Cavalho, A.A.T., Frezzini, C. & Potter, S., 2009 'Oral Complication of HIV Disease' *Clinics(sao Paulo)*64(5):459-470

Level & Trends in Child Mortality. Report 2011. Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA, UNPD). <http://www.indexmundi.com> on 06/05/2013

Lieff, S., Boggess, K.A., Murtha, A.P., Jared, H., Madianos, P.N., Moss, K., Beck, J. & Offenbacher, S., 2004 'The oral conditions and pregnancy study: periodontal status of a cohort of pregnant women' *Journal of Periodontology* 75(1):116-126.

Macek, M.D., Manski, M.C., Schneiderman, M.T., Meakin, S.J., Haynes, D., Wells, W., Bauer-Leffler, S., Cotten, P.A. & Parker RM., 2011 'Knowledge of oral health issues among low-income Baltimore adults: a pilot study' *Journal of Dental Hygiene*, 85(1):49-56.

Mouton, J., 2009 'Understanding Social Research' (Six Edition), Van Schaik Publishers.

Mwaiswelo, R.O. & Masalu, J.R., 2007 'Oral health Knowledge and behaviour among pregnant women in Kyela District, Mbeya, Tanzania' *Tanzania Dental Journal* 14(2):47-52.

Mwangosi, I.E.A.T. & Kiango, M.M., 2012 'Oral health experience during pregnancy and dental service utilization in Bariadi District, Tanzania' *Tanzania Journal of Health Research* 14(2).

New York State Department of Health, 2006 'Oral Health Care during Pregnancy and Early Childhood. Practice Guidelines' Retrieved from http://www.health.ny.gov/publications/0824/pda/windows_mobile/0824_child_health_professionals.pdf on 11/03/2013.

Ncube, E. J & Schutte, C.F., 2005 'The occurrence of fluoride in South African groundwater .A water quality and health problem' *Water SA* 31 (1)

- Ogundipe, S., 2004 'World Health Organization worries over Dental Problems in Africa' Retrieved from <http://allafrica.com/stories/200403020599.html> on 09/03/2013.
- Onigbinde, O.O., Sorunke, M.E., Braimoh, M.O., Adeniyi, A.O., 'Periodontal status and some variables among pregnant women in a Nigeria tertiary institution' *Ann Med Health Science Res* 2014;4:852-7.
- Orenuga, O.O. & Sofola, O.O., 2005 'A survey of knowledge, attitude and practices of antenatal mothers in Lagos Nigeria about the primary teeth' *African Journal of Medicine and Medical Sciences* 34(3): 285-291.
- Oxford Online Dictionary, 2013 retrieved from <http://oxforddictionaries.com/definition/english/knowledge> on 04/07/2013.
- Papp, E., Kengyeli, I, Bánóczy, J., & Csordás, T., 1990 ' Longitudinal study of the dental status of pregnant women under prenatal care' *Fogorvosi Szemle*, 83(7):199-204.
- Pepin, M.T., 2010 'Dental care during pregnancy' Retrieved from [www. Dental Care during Pregnancy](http://www.dentalcare.org) on 09/07/2012
- Petersen, P.E., 2003 'Oral Health & Preventive Dentistry, *World Health Organization* 1(4):309-315. Retrieved from www.who.int 10/10/2012.
- Petersen, P.E., 2004 'Priorities for research for oral health in the 21st Century – the approach of the WHO' *Community Dental Health* 22(2):71-74.
- Petersen, P.E., 2003 'Continuous improvement of oral health in the 21st century - The approach of the WHO Global Oral Health Programme' Retrieved from www.who.int on 10/10/2012.
- Rakchanok, N., Amporn, D., Yoshida, Y., Harun-Arun-Or-Rashid, M., & Sakamoto, J., 2010 'Dental Caries and Gingivitis among Pregnant and Non-Pregnant Women in Chiang Mai, Thailand' *Nagoya Journal of medicine science* 72(1-2):43-50.
- Saddki, N., Yusoff, A., & Hwang, Y.L., 2010 'Factors associated with dental visit and barriers to utilization of oral health care services in a sample of antenatal mothers in Hospital University Sains Malaysia' *Bio med central Public Health* 10:75
- Scannapieco, F.A., Bush, R.B., Paju, S., 2003 'Periodontal Disease as a risk Factor for Adverse Pregnancy Outcomes, A systemic Review' *ann Periodontol* V8 (1)

- Salmeri, J., 2010 'How to Choose the Right Toothbrush' *Current Situation and Future*
<http://www.dynamicdentalinc.com/blog/bid/45305/How-to-choose-the-right-toothbrush>
- Sgan-Cohen, H.D. & Mann, J., 2007 'Health, oral health and poverty' *The Journal of the American Dental Association*.138 (11): 1437-1442.
- Shah,A.P., Pamar,S.A., Ramkishan,A & Mehta,A.A.,2011' Knowledge,attitude and practice(KAP) survey regarding the safe use of medicines in rural area of Gujarat *Adv Trop Med Pub Health Int* 1(2):66-70
- Shathini, V., Vanka, A., Bhambal, A., Saxena, V., Saxena, S., & Kumar, S.S., 2012 'Association of pregnant women periodontal status to preterm and low-birth weight babies: A systematic and evidence-based review, *Dent Res Journal* 9(4):368-380
- Smyth, E., Caamaño, F., & Fernández-Riveiro, P., 2007 'Oral health KAP. Oral health knowledge, attitudes and practice in 12-year-old school children' *Medicinal Oral, Patología Oral Cirugía Bucal* 12(8):614-620.
- Sofola, O.O., 2010 'Implications of low oral health awareness in Nigeria' *Nigerian Medical Journal* 51(3): 131-133.
- Silal, S.P., Penn-Kekana, L., Harris,B.,Birch,S., & McIntyre,D., 2012 'Exploring inequalities in access to and use of maternal health services in South Africa' doi:10.1186/1472-6963-12-120
- Steer, P., 2005 'The epidemiology of preterm labour BJOG' *International Journal of Obstetrics and Gynaecology* Vol. 112, Supplement 1, pp. 1– 3
- Taheri,J.B, Azimi,S, Mathew ,A & Pisgah,M ,2013 'Comparison of Periodontal Status between Pregnant and nonpregnant Woman' *International journal Experiment Dent Sci*,2:82-85
- Tang, Y., Zhu, Y.Q., Wang, Y.,& He, Y.,2011 'A survey about knowledge, attitude, practice of oral health in pregnant women of one hospital in Shanghai municipality' *Shanghai journal of stomatology* 20(5):531-4.
- Thomas, N.J., Middleton, P.F., & Crowther, C.A., 2008 'Oral and dental health care practices in pregnant women in Australia: a postnatal survey, discipline of Obstetrics and Gynaecology' *Bio Med Central Pregnancy and Childbirth*8:13

Thorpe, S., 2006 'Oral Health Issues in the African Region: Current Situation and Future Perspectives' *Journal of Dental Education* 70 (11):8-15

Tomar, S.L., & Asma, S., 2000 'Smoking-attributable periodontitis in the United States: findings from NHANES III. National Health and Nutrition Examination Survey' *Journal of Periodontology* 71(5):743-751.

United Nations Children's Fund and World Health Organization 'Low Birth weight: Country, regional and global estimates' UNICEF, New York, 2004 Retrieved from www.unicef.org/publications/files/low_birthweight_from_EY.pdf on 05/12/2012

U.S. Department of Health and Human Services. 'National Call to Action to Promote Oral Health, Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Dental and Craniofacial Research. NIH Publication No. 03- 5303, Spring 2003. Retrieved from <http://www.surgeongeneral.gov/library/calls/oralhealth/nationalcalltoaction.pdf> on 09/03/2013

Venter, B., 2004' Bad oral hygiene can lead to death' Published by SA Times

Vogt, M., Sallum, A.W., Cecatti, J.G., & Morais S.S., 2010 'Factors associated with the prevalence of periodontal disease in low-risk pregnant women' *Reproductive Health Journal*, 9:3

Wandera, M., Engebretsen, I.M.S., Okullo, I., Tumwine, J.K., Åstrøm, A.N & the PROMISE-EBF Study Group, 2009 'Socio-demographic factors related to periodontal status and tooth loss of pregnant women in Mbale district, Uganda' *Bio Med Central Oral Health* 9:18

Watt, R.G., 2005 'Strategies and approaches in oral disease prevention and health promotion' *Bulletin of world health organisation* 83 (9):711-718

World Health Organization, 2008 'Advocacy, communication and social mobilization for TB control a guide to developing knowledge, attitude and practice survey' Retrieved from http://whqlibdoc.who.int/publications/2008/9789241596176_eng.pdf on 10/12/2011

World Health Organisation, 2010 'The worldwide incidence of pre-term birth: a systematic review of maternal mortality and morbidity' Retrieved from <http://www.who.int/bulletin/volumes/88/1/08-062554/en> on 04/07/2013



Retrieved from

http://apps.who.int/gho/indicatorregistry/App_Main/view_indicator.aspx?iid=76 on 02/03/1012.

Wilder, R., 2011 'Report of the Global Oral Health Inequalities Task Group on Periodontal Disease: implications for dental hygienists' *Journal of Dental Hygiene*. 85(2):76-77

Wilder, R., Robinson, C., Hared H.L., Lieff, S. & Boggess, K., 2007 'Obstetricians' knowledge and practice behaviours concerning periodontal health and pre-term delivery and low birth weight' *Journal of Dental Hygiene* 81(4):81

Zeeman, G.G., Veth, E.O., & Dennison, D.K., 2001 'Focus on primary care. Periodontal disease: implication for women's health' *Obstretical & Gynecological Survey* 56 (1):43-9.

(3) Divorced

(4) Widowed

3. What is your level of education?

(1) Primary level

(2) Secondary level

(3) Tertiary

4. Are you employed?

(1) Employed

(2) Unemployed

5. If you have answered NO to the question above, who is taking care of you?

(1) Boyfriend

(2) Parents

(3) Husband

(4) Other.....



Questionnaire

Please answer the following and ask for help if you do not understand.

SECTION 1: Demographic data

1. How old are you?

2. What is your marital status?

(1).Single

(2).Married

(3).Divorced

(4).Widowed

3. What is your level of education?

(1). Primary level

(2). Secondary level

(3). Tertiary

4. Are you employed?

(1).Employed

(2).Unemployed.

5. If you have answered NO to the question above, who is taking care of you?

(1).Boyfriend

(2).Parents

(3).Husband

(4).Others.....

UNIVERSITY OF VENDA
LIBRARY

Pregnancy

History of pregnancy

This Table will assist you to respond to questions 14-19, please refer to it when responding to these questions. List of possible answers to question 14-19

6. This is my.....?

(1). First pregnancy

(2). Second pregnancy

(3). Third pregnancy

(4). Fourth pregnancy

(5).Other (Specify).....

7. Previous deliveries, have you ever had any baby born before term (9 months)?

(1).Yes

(2).No

If yes, state the cause.....

9. What are the oral health problems that can affect a pregnant woman?

(1).....

(2).....

(3).....

(4).....

SECTION 2: Knowledge of the respondent regarding dental hygiene and therapy during pregnancy

This Table will assist you to respond to questions 14-19, please refer to it when responding to those questions. List of possible answers to question 14-19

Knowledge scale 0-1= low knowledge, 2=Moderate knowledge and 3-4=high knowledge

- Gum pain
- Visiting Clinic
- Increasing the frequency of brushing teeth
- Fruits
- Bleeding of gums
- Listening to oral health talk on radio
- Milk
- Important
- Eye infection
- Healthy diet
- Not brushing teeth
- Breath freshener
- Flossing after meals
- Oral Infection
- Cake
- Health talks in clinics
- Hospital
- Sweets
- Tooth decay
- Brushing twice a day
- Sweetened drinks
- Visiting the Dentist
- Ice-Cream
- Swelling of gums
- Reading oral health pamphlets
- Chicken pox
- Not important

9. What are the oral health problems that can affect a pregnant woman?

- (1).....
- (2).....
- (3).....
- (4).....

10. Bleeding of the gums may result from the following;

(1).....

(2).....

(3).....

(4).....

11. What are the foods that can cause tooth decay?

(1).....

(2).....

(3).....

(4).....

12. Oral health awareness can be improved by?

(1).....

(2).....

(3).....

(4).....

13. Bleeding gums during pregnancy can be avoided by:

(1).....

(2).....

(3).....

(4).....

SECTION 3: Attitude of the respondents regarding dental hygiene and therapy during pregnancy

Description	SD	D	A	SA
15. Pregnancy increases oral problems				
16. Oral health services in antenatal clinics is good				
17. Antenatal clinic is well equipped for oral care.				
18. Health education on oral health is offered during antenatal care.				
19. Dental therapy is safe during pregnancy.				
20. An unborn baby is not affected by poor oral care during pregnancy				
21. Oral health examination is always done during antenatal care				

SD=Strongly Disagree; D=Disagree; A=Agree; A=Strongly Agree

SECTION 4: Practice of respondents regarding dental hygiene and therapy during pregnancy.

22. How often do you visit the dentist for routine check up?

- (1).6 Monthly..... (2) Once a year..... (3) Only when there is pain..... (4) Not at all.....

23. How many times per day do you brush your teeth?

- (1).Once a day..... (2).Twice a day..... (3).Do not brush every day.

24. When do you brush your teeth?

- (1) In the morning only..... (2) After eating..... (3) Before Eating..... (4) Morning and at night.

25. How often do you change your tooth brush?

- (1)After 6 months..... (2) After 12 months..... (3) Longer.....

26. What type of toothbrush are you using **the moment?**

(1) Soft bristle tooth-brush..... (2) Hard bristle tooth-brush(3)

Do not have a toothbrush.....

SECTION 5: Challenges being faced by respondents regarding oral health and therapy in pregnancy

27. Does your antenatal clinic offer oral health services?

(1). YES (2) NO.....

28. If your answer is no, are you referred.....

29. What is the distance from your home to the clinic?

(1) Needs transport..... (2) walkable distance.....

29. What are your reasons for not visiting a dentist during pregnancy?

(1). Difficult to get appointment..... (2)Fear of pain..... (3)

Transport difficulty..... (4)Other.....

30. Which dental professional is accessible to you?

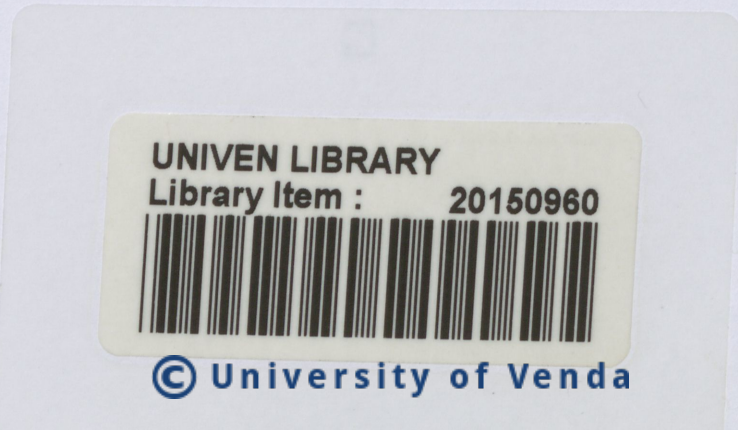
(1) Nurse..... (2)Dental assistance..... (3) Hospital

Dentist..... (4) Private Dentist

31. Do you pay for dental service during pregnancy?

(1) Free..... (2)Pay Cash..... (3)Use medical

aid.....





Mbudzisavhathu

Ndaela

Kha vha fhindle mbudziso dzi tevhelaho, vha humbele thuso hune vha si pfesese.

KHETHEKANYO 1: Data dza Murafho

1. Vha na minwaha mingana?

2. Tshiimo tsha vhudzekani ndi tshifhio?

(1). Vha vhoṭhe

(2). Vho malwa

(3). Vho ṭalwa

(4). Vha tshilikadzi

3. Tshiimo tsha nṭhesa tsha pfunzo ndi tshifhio?

(1). Tshiimo tsha phuraimari

(2). Tshiimo tsha sekondari

(3). Tshiimo tsha nṭha ha sekondari

4. Vha a shuma?

(1). Ee

(2). Hai

5. Arali vho fhindula Hai kha mbudziso ya **Kha vha thogomelwa nga nnyi?**

- (1). Munna
- (2). Vhabebi
- (3). Mufunwa a sa athu u mala
- (4). Vhanwevho

Divhazwakale ya vhuimana

6. Tshivhalo tsha u dhwala ndi vhungana?

- (1). U thoma u dhwala.
- (2). U dhwala lwa vuvhili.
- (3). U dhwala lwa vhuraru.
- (4). U dhwala lwa vhuṅa
- (5). Tshiṅwe (Kha vha buletshedze).....

7. U beba lwo fhiraho, ho vhuya ha vha na ṅwana o bebwaho hu sa athu u swika (miṅwedzi ya miṅanu na mina)?

- (1). Ee
- (2). Hai

8. Arali hu ee, kha vha sumbedze tshivhangi.....

KHETHOKANYO 2: Ndivho ya vhavhudziswa nga ha mutakalo wa hanwani kha vhafumakadzi vho ḏihwalaho. Mutevhe hoyu u ḏo vha thusa u fhindula mbudziso 14-19, kha vha sedze khawo musu vha tshi fhindula idzo mbudziso. Mutevhe wa phindulo dzi konadzeaho kha mbudziso 14-19. Tshikalo thsa ndivho 0-1 ndivho thukhu 2 ndivho ya vhukati 3-4 ndivho ya ntha

Vhuṭungu ha marinini.

U dalela Kiliniki

U engedza u hwaya maṅo

Mitshelo

Maruḁa

U bva malofha kha marinini.

U silingwa na u ṭanza

U thetshesela nga zwa mutakalo wa mulomoni radioni

Mafhi

Ndi zwa ndeme

Zwiḽiwa zwa pfushi

Vhuṭungu ha maṅo

Zwi vusuludza mufemo muswa

Nguda Mutakalo

Sibadela

Maḽegere

U sina maṅo

U hwaya maṅo luvhili nga ḏuvha

Zwinwiwa zwi ṭapitelaho

Nanga ya mano

U zwimba ha marinini

U vhala bugu, magazini, kana mabambiri nga ha mutakalo wa maṅo.

U sa hwaya maṅo

U somola

U kavhiwa nga zwitshili mulomoni

Zwimuṅemuṅe zwa swigiri

Asi zwa ndeme

9. Ndi dzifhio thaidzo dza mutakalo wa mulomoni dzi nga kwamaho mufumakadzi o dihwalaho?

(1).....

(2).....

(3).....

(4).....

10. Naa u bva malofha kha marinini zwi nga itiswa nga mini?

(1).....

(2).....

(3).....

(4).....

11. Ndi zwifhio zwiliwa kana zwinwiwa zwine zwa vhanga u sina ha maṅo?

(1).....

(2).....

(3).....

(4).....

12. Tsivhudzo ya mutakalo wa mulomoni i nga khwiṅisea nga?

(1).....

(2).....

(3).....

(4).....



13. U bva malofha mulomoni zwi nga th^o e^{ti}wa ngani?

(1).....

(2).....

(3).....

(4).....

KHETHEKANYO 3: Mbonalo ya vhavhudziswa nga ha mutakalo wa haḽwani kha vhafumakadzi vho ḽihwalaho.

Ṫhaluso	ATendesi	ATendi	NTenda	NTendesa
15. U ḽihwala zwi engedza u lwala ha haḽwani				
16. Tshumelo ya mutakalo wa mulomoni ndi yavhuḽi tshikaloni.				
17. Tshikaloni hu na tshomedzo dzoṭhe dza maḽo/ṭhoḽea dza thaidzo dza mulomoni?				
18. Pfunzo ya mutakalo /vhuṭanzi vhu fushaho nga ha mutakalo wa mulomoni vhu a wanala tshikaloni				
19. Dzilafho ḽa maḽo tshifhingani tsha u ḽihwala ḽo tsireledzea				
20. Nwana a sa athu bebwa ha kwamei nga u sa ṭhogomela mulomo vho ḽihwala				
21. U sedzwa mulomoni zwi itiwa tshifhinga tshoṭhe tshikaloni				

KHETHEKANYO 4: Nḡowenḡowe ya vhavhudziswa nga ha mutakalo wa hanwani kha vhafumakadzi vho ḡihwalaho

22. Vha dalela lungana ḡanga ya maḡo u ḡolwa lwa tshifhinga tshoḡhe.

- (1) Nga murahu ha minwedzi ya 6..... (2)Luthihi nga nwaha.....
(3)Vha tshi pfa u vhuḡungu mulomoni..... (4)A thiyi na luthihi.....

23. Kha ḡuvha vha hwaya maḡo lungana?

- (1)Luthihi..... (2)Luvhili..... (3)A thi hwayi na luthihi

24. Vha hwaya maḡo lini?

- (1) Nga matsheloni fhedzi..... (2)Vha tshi fhedza uḡa.....
(3)Vha sa a thu uḡa..... (4)Nga matsheloni na nga madekwana

25. Ndi lungana hune vha tshintsha bulatsho ya maḡo?

- (1)Nga murahu ha minwedzi ya 6..... (2)Nga murahu ha nwaha (3) Athi tshintshi

26. Ndi lushaka lufhio lwa bulatsho ya mano lune vha shumisa zwino?

- (1)Bulatsho ya maḡo masekene..... (2)Bulatsho ya maḡo o khwaḡhaho..... (3) A thi na bulatsho ya maḡo.

27. Vha itani arali vha na u sa ḡipfesesa kha mutakalo wa maḡo zwa zwino ndi uri vha tshi pfa vhuḡungu mulomoni kana marinini a tshi bva malofha?

- (1)Ndi litsha u dzhiela nzhele vhuḡungu..... (2)Ndi dalela kiliniki..... (3)Ndi nwa philisi dza u thivhela vhuḡungu.



APPENDIX C: Application letter to conduct research

Department of Health.

Ref : 11612600

P.O Box 358

Enq : Musehane F.

Sibasa

Cell No : 0720718368

Venda

0970

Signature

The Head of Department

Department of Health

Private Bag X 9302

Polokwane

0700

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I am a Masters of Public Health student at the University of Venda, School of Health Sciences. Based on the curriculum of my program, I am required to conduct a research in a study that will benefit the community. I therefore request permission to conduct the study.

The study is entitled "Knowledge, Attitude, Practices and Challenges regarding oral health among pregnant women in Thulamela Municipality, Limpopo Province, South Africa".

The study will focus on pregnant women who are attending antenatal clinics in Thulamela Municipality (B).

This study is vital because poor oral hygiene and poor-therapy-seeking behavior during pregnancy contributes to oral infections that predispose pregnant women to delivering low

birth weight and premature babies. It is therefore imperative to assess pregnant woman level of knowledge on dental hygiene and therapy, their practices and any challenges they encounter in accessing this services.

The results of this study will assess the level of knowledge of dental /oral hygiene and challenges in seeking therapy during pregnancy and to improve policies on prenatal care.

Kind Regards

F.Musehane

E-mail
.....

Signature

Date

I am a Masters of Public Health student at the University of Venda, School of Health Sciences. Based on the curriculum of my program, I am required to conduct a research where I will collect data on my research title.

Your willingness to participate in this research project will be greatly appreciated. Kindly complete the consent form on the space provided below should you consent to participate.

Kindly take note of the following:

- Your participation in this study is voluntary.
- You may withdraw from the study at any time.
- The information you provided will be treated as confidential.
- For any queries about this research, please contact the researcher at the above contact details.

Researcher's signature Date

Participant

I (full name and surname)
No. have read the content of this form and I willingly consent to participate in this study project.

Participant's signature Date

APPENDIX D: Consent form (English Version)

Participant Consent Form

Research Title : Knowledge, Attitude, Practice and Challenges regarding oral health among pregnant women in Thulamela Municipality, Limpopo Province, South Africa.

Researcher : F.Musehane.

Cell No : 0720718368.

E-mail : ndivhumuse@vodamail.co.za

I am a Masters of Public Health student at the University of Venda, School of Health Sciences. Based on the curriculum of my program, I am required to conduct a research where I will collect data on my research title.

Your willingness to participate in this research project will be greatly appreciated. Kindly complete the consent form on the space provided below should you consent to participate.

Kindly take note of the following:

- Your participation in this study is voluntary.
- You may withdraw from the study at any time.
- The information you provided will be treated as confidential.
- For any queries about this research, please contact the researcher at the above contact details.

Researcher's signature.....Date.....

Participant

I (full name and surname).....ID

No.....have read the content of this form and I willingly consent to participate in this study project.

Participant's signature.....Date.....

Muengedzedzo wa vhuraru

Fomo ya thendelo ya mudzheneleli (Venda Version).

Thoho ya thodiso: Ndivho, Mbonalo, Maitete na Thaidzo dzi elanaho na mutakalo wa mulomoni kha vhafumakadzi vho dihwalaho kha vhupo ha Masipala wa Thulamela, Vundu la Limpopo, Afrika Tshipembe.

Muṭodisisi: Mufumakadzana F.Musehane

Nomboro ya Luṭingo thendeleki: 072-071-8368

E-meili: ndivhumuse@vodamail.co.za

Nṅe, Fulufhedzani Musehane, ndi mutshudeni wa Masiṭasi kha Muhasho wa Mutakalo wa Nnyi na Nnyi kha Yuniversithi ya Venda kha Tshikolo tsha Santsi dza Mutakalo.

Zwi tshi elana na vhuteapfunzo ha mbekanyamushumo yanga, zwi khou ṭoṭea uri ndi ite thodiso hune nda ḍo kuvhanganya data.

Dzangalelo la vho kha u dzhenela thandela hei ya thodiso li ḍo takalelwa nga maanda.

Kha vha ḍadze fomo ya thendelo kha livhaka lo ṅetshedzwaho afho fhasi arali vha tshi tama u shela mulenzhe

Kha vha dzhiele nzhele kha zwi tevhelaho:

- U shela havho mulenzhe kha ngudo hei ndi ha u tou funa.
- Vha nga kha ḍi dibvisa kha ngudo hei tshifinga tshinwe na tshinwe.
- Vhuṭanzi he vha ṅetshedza vhu ḍo dzhiwa vhu tshidzumbi.
- Arali vha na mbudziso inwe na inwe nga thodiso iyi, kha vha kwamane na muṭodisisi kha nomboro dza vhukwamani dzi re afho nṅha.

Mudzheneli: Nṅe (Madzina nga vhuḍalo na tshifani) -----

No.ya ID-----

Tsaino ya mudzheneli-----Datumu-----



Ndo vhala hei fomo ya thendelo na u **Thulamela** tenda na u nea thendelo ndi sa kombetshedzwi u shela mulenzhe kha thandela ya ngudo hei.

Tsaino ya muḁḁisisi----- Datumu-----

Student No: 11612600

PROJECT TITLE: Knowledge, attitudes, practices, and challenges regarding oral health among pregnant women in Thulamela Municipality, Vhembe District, Limpopo Province, South Africa.

PROJECT NO: SHS/13/PH/07/1018

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION/ DEPARTMENT	ROLE
Prof M. Akinsola	University of Venda	Supervisor
Ms J. Jacobunda	University of Venda	Co-supervisor
Ms F. Musehane	University of Venda	Supervisor / Researcher

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: November 2013

Decision by Ethical Clearance Committee: Granted

Signature of Chairperson of the Committee: _____

Name of the Chairperson of the Committee: Prof. C. A. Ekoto



University of Venda
PRIVATE BAG 3696, THULAMELA, VHEMBE DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA
TELEPHONE: (018) 352 2674, (018) 352 2675
"A world driven forward by learning, not fear."

UNIVERSITY OF VENDA
LIBRARY

NAME OF RESEARCHER/INVESTIGATOR:

Ms F Musehane

Student No: 11612600

PROJECT TITLE: Knowledge, attitudes, practices, and challenges regarding oral health among pregnant women in Thulamela Municipality, Vhembe District, Limpopo Province, South Africa.

PROJECT NO: SHS/13/PH/07/1018

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Prof HA Akinsola	University of Venda	Supervisor
Mrs JT Mabunda	University of Venda	Co-supervisor
Ms F Musehane	University of Venda	Investigator - Student

ISSUED BY:

UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: November 2013

Decision by Ethical Clearance Committee Granted

Signature of Chairperson of the Committee:

Name of the Chairperson of the Committee: Prof. G.E. Ekosse



University of Venda

PRIVATE BAG X5050, THOHOYANDOU, 0950, LIMPOPO PROVINCE, SOUTH AFRICA
TELEPHONE (015) 962 8504/8484 /8313 FAX (015) 962 8439

"A quality driven financially sustainable, rural-based Comprehensive University"



DEPARTMENT OF HEALTH

Enq: Neluvheda LR

Date: 15 Apr 2014

Enquiries: Latif Shamila

Ref:4/2/2

Musehane F

University of Venda

Private Bag X5050

Thohoyandou

0950

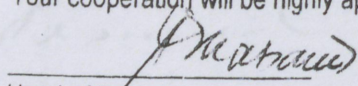
Greetings,

Re: Knowledge, practice and challenges regarding oral health among pregnant woman in Thulamela Municipality, Vhembe District, Limpopo Province, South Africa.

The above matter refers.

1. Permission to conduct the above mentioned study is hereby granted.
2. Kindly be informed that:-
 - Further arrangement should be made with the targeted institutions.
 - In the course of your study there should be no action that disrupts the services.
 - After completion of the study, a copy should be submitted to the Department to serve as a resource.
 - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.

Your cooperation will be highly appreciated.


Head of Department

03/03/2014
Date



LIMPOPO

PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH VHEMBE DISTRICT

Enq: Neluvhada LR

Date: 15 Apr 2014

To: Musehane F

Attention: Thulamela Sub-District Manager.

From Acting Senior Manager PHC

SUBJECT: RE-REQUEST TO CONDUCT STUDY AT 6 CLINICS

1. The above matter has reference.
2. The Department of Health has acknowledged your communiqué received on the 15 April 2014 for the above mentioned.
3. Kindly be informed that permission has been granted to conduct study at Thohoyandou Health Centre, Sibasa Clinic, Tshififi Clinic, Tswinga Clinic, William Eddie Health Centre and Mukula Clinic.
4. NB: You are also advised to comply or adhere with the Departmental policies; rules and regulations.

Hoping that you will find this in order.

ACTING DISTRICT EXECUTIVE MANAGER

DATE: 16/04/2014

Private Bag X5009 THOHOYANDOU 0950
Old Parliamentary Building Tel: (015) 962 1848, (015) 962 1852, (015)962 1001/2/3/4/5/6
Fax: (015) 962 2373/ (015) 9622274/ 4623.

The heartland of Southern Africa – development is about people!