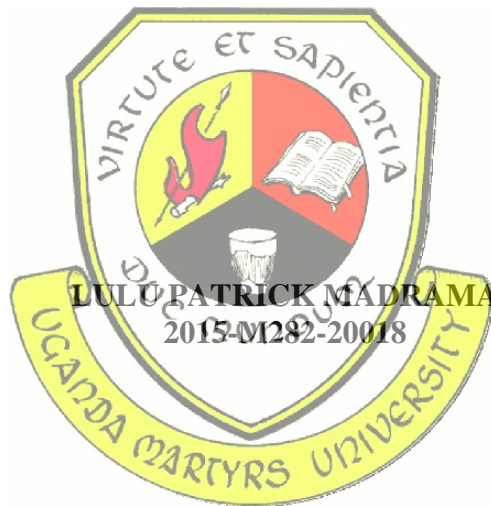


**FACTORS INFLUENCING ADOPTION
OF ORAL HEALTH PROMOTION
BY ANTENATAL CARE PROVIDERS IN MOYO DISTRICT**



UGANDA MARTYRS UNIVERSITY

OCTOBER, 2018

**FACTORS INFLUENCING ADOPTION
OF ORAL HEALTH PROMOTION
BY ANTENATAL CARE PROVIDERS IN MOYO DISTRICT**

**A POSTGRADUATE DISSERTATION
PRESENTED TO
THE FACULTY OF HEALTH SCIENCES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE AWARD OF THE DEGREE
MASTERS PUBLIC HEALTH- HEALTH PROMOTION
UGANDA MARTYRS UNIVERSITY**

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Dedications

This Research report is dedicated to the Almighty God for making me who I am today and to my beloved parents for the endless love they gave in raising me up.

Dedication also goes to my dear brothers and sisters for the courage and support they provided to me during my studies, and to all my dear relatives and friends.

Executive Summary

Introduction: Oral health promotion during pregnancy has been recognized as an important global public health issue and number of statements and guidelines have been published emphasizing the need for improved oral health care of pregnant mothers and prenatal care providers have this critical opportunity to promote oral health. In Uganda in the year 2009, the prevalence of tooth loss among pregnant mothers was 35.7%, with 63.4% bleeding calculus and 67.0% in 2012 had periodontal diseases. In Moyo district, there is limited data on the level and factors associated with adoption of Oral health promotion by antenatal care providers. The objective of this study was to establish factors influencing adoption of oral health promotion by Antenatal care providers.

Methods: Descriptive Cross-sectional study employing both quantitative and qualitative data collection methods and analysis was used. Data was obtained from 152 antenatal care providers using Yamane's formula. A population proportionate to simple size sampling was used to estimate the number of health providers interviewed in the selected health facilities and simple random sampling was employed to obtain required participants at the selected health facilities. Three FGDs were held among antenatal care providers and six key informant interviews were held for healthcare managers. For quantitative data, univariate, bivariate and multivariate analysis was performed in SPSS version 20.0, while qualitative were transcribed verbatim, coded and organised in themes in ATLAS.ti.

Results: It was observed that 42(28%) ANC providers had adopted oral health promotion (OHP). ANC providers with moderate knowledge were three times more likely to adopt oral promotion (aOR=3.205, 95%CI=1.050-9.785, p= 0.041*) and there was statistically significant association between having moderate knowledge and adoption of oral health promotion. Having good understanding between dentists and antenatal care providers contributed to 25.1% adoption of OHP (aOR=0.251, 95%CI=0.0093-0.677, p=0.006*). Management being at influencing new practices contributed to 50.8% adoption of oral health promotion and there no statistically significant relationship (aOR=0.508, 95%CI=0.187-1.384, p=0.186). There was some level of misconception about prenatal oral health care among Health managers, ANC providers, although ANC providers, including health managers were willing to stand out to advocate adoption of Oral health promotion. Both national and local negligence of oral health issues, limited continuous staff training on oral health, poor dissemination of National oral health policy and no local oral health care guideline for ANC providers were some of key issues that emerged from the qualitative results.

Conclusion: Adoption of Oral health promotion by antenatal care providers was low. Being Knowledgeable and having good understanding with dentists and management being good at influencing new practices contributed to increased level in adoption of oral health promotion. However, having misconception, knowledge gap, and poor dissemination of National oral health policy and lack of prenatal oral health guideline where some of the barriers to decreased level of adoption by antenatal care providers.

Recommendation: Ministry of health, district and sub-districts need to enhance the knowledge of ANC providers through training, need for deliberate effort to initiate good understanding and collaboration between ANC providers and dentists, need to review and implement the current National Oral health policy involving different cadres to easy dissemination and clearly indicating how to promote oral health of pregnant mothers.

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List of Abbreviations

| | |
|--------|--|
| ANC | Antenatal Care Services. |
| aOR | Adjusted Odds Ration. |
| AHSPR | Annual Health Sector Performance Report. |
| CI | Confidence Interval. |
| ECC | Early Childhood Caries. |
| FDG | Focus Group Discussion. |
| HSSIP | Health Sector Strategic and Investment Plan. |
| IEC | Information, Education and Communication. |
| KI | Key Informant. |
| MoH | Ministry of Health. |
| OHC | Oral Health Care. |
| UBOs | Uganda Bureau of Statistics. |
| UMU | Uganda Martyrs University. |
| UNICEF | United Nations Child's Education Fund. |
| uOR | Unadjusted Odds Ration. |
| WHO | World Health Organization. |

Operational Definitions

| | |
|-----------------------|--|
| Adoption | Decision of an Organization, community or individual to commit to and initiate an evidence-based intervention (Rogers, 2003). |
| Advocacy for Health | A combination of individual and social actions designed to gain political commitment, policy support, social acceptance and systems support for a particular health goal or programme (WHO, 1995). |
| Health Promotion | The process of enabling people to increase control over, and to improve their health (WHO, 1986). |
| Healthy Public Policy | Healthy public policy is characterized by an explicit concern for health and equity in all areas of policies in all sectors, and by accountability for health impact (WHO, 1988). |
| Oral Health | A state of being free from mouth or dental pain, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing (WHO, 2012). |
| Oral Hygiene | The practice of cleaning the mouth by means of brushing, flossing, irrigating, massaging or use of other devices (Medical dictionary). |
| Periodontal Disease | A destructive inflammatory disorder of the hard and soft tissues surrounding teeth (Boggess <i>et al.</i> , 2011). |

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Oral disease is one of the most common public health issues worldwide with significant socio-economic impacts and the global burden of periodontal disease, oral cancer and caries was 45.6% between 1990 and 2010 in the general population (Marcenes *et al.*, 2013). Among pregnant women, the common oral health diseases are periodontal diseases with a prevalence of up to 74% (Cheng *et al.*, 2014).

Antenatal care is the care provided by skilled health-care professionals to pregnant women and adolescent girls in order to ensure the best health conditions for both mother and baby during pregnancy and its components are; risk identification, prevention and management of pregnancy-related or concurrent diseases including health education and health promotion (WHO, 2016).

Oral health is a basic human right fundamental to people's quality of life (Mossey and Petersen, 2014), achieving oral health goals would require health systems being supported by enabling actions in education, improved nutrition and hygiene (Mathur *et al.*, 2015).

The prevalence of gingivitis among pregnant women ranging from 30% to 100% and this could be reduced by integrating oral health promotion into antenatal care (Onigbinde *et al.*, 2014). In the view to curb the oral health challenges, global goals for oral health 2020 were set which included the need to integrate oral health promotion and care with other sectors that influence using the common risk factors (Hobdell *et al.*, 2003).

Pregnancy provides an opportunity for women to initiate new healthy behaviours, including oral health practices. Dental and prenatal care providers have missed these critical opportunity to promote oral health (Marchi *et al.*, 2010). Some of the missed opportunities for oral health promotion include; oral health education, oral health examination and referral for dental services during the time when mothers are receiving antenatal care.

Globally, numbers of statements and guidelines have been published emphasizing the need for improved oral health care of pregnant mothers due to the fact that hormonal changes during pregnancy combined with neglected oral hygiene tend to increase the incidence of oral diseases including gingivitis (Al Mullahi *et al.*, 2012).

United States of America, department of Health and Human Services highlighted the need for partnerships between dentists and other health professionals, including nurses and midwives and these recommendations have resulted into the development of evidence based practice guidelines for oral health care during pregnancy and early child-hood for all health professionals including prenatal care providers (American Academy of Pediatric Dentistry, 2009 ; California Dental Association Foundation, American College of Obstetricians and Gynecologists, 2010; National Maternal and Child Oral Health Resource Center, 2008).

General programs have been designed in the public health sector based on partnerships with various private and public health organizations, governmental bodies and academic institutions, using various strategies to empower oral health integrated care (Harnagea *et al.*, 2018).

In low and middle-income countries, the incidence of tooth decay is rapidly on increase among adults and there will be a huge burden of this health problem in the future if sustainable programs are not put in place (WHO, 2015). Good oral health of a pregnant woman should be

considered to be of utmost importance for dental practitioners and antenatal care providers (Ramamurthy and Irfana, 2017).

In Malaysia, the need for adoption of oral health promotion was recognized and taken into full force since 2004, Oral health care policy guide for antenatal mothers was then developed which guide included; oral health promotion, comprehensive oral healthcare, collaboration with other healthcare professionals and ensuring higher utilization of oral health services (Ministry of Health Malaysia, 2004).

Oral health integration into primary care has been implemented in some health care systems to reduce the burden of oral health disease and to improve access to oral health care, especially for disadvantaged population and communities (Petersen, 2014). Asia developed a strategy in which emphasis were put on integration of oral health promotion and other disease prevention strategies (WHO, 2009).

Although debate continues over the causal link between poor oral health and pregnancy outcomes, various countries have implemented preventive strategies to maintain the oral health of mothers during pregnancy (Ajesh *et al.*, 2011).

Adopting an integrated approach to healthcare would achieve better outcomes for patients with oral diseases and several policy recommendations have been made including adoption of oral health in all policies, strengthening inter-professional collaboration, and inclusion of oral health in curriculum for all healthcare professionals (World Dental Federation, 2013).

In addition, WHO global policy for improvement of oral health showed that promotion of oral health is a cost-effective strategy to reducing the burden of oral diseases and maintaining oral health and quality of life. Oral Health services should focus on prevention and early diagnosis (Petersen, 2008).

In Sub-Saharan Africa, there is increased prevalence of dental diseases, resulting from increased consumption of sugars and inadequate exposure to fluorides (WHO, 2013), with increased burden of periodontal diseases among pregnant women in Mali (Hess *et al.*, 2017), while pregnant mothers in Tanzania had increased burden bleeding gum, dental pain, tooth decay and swollen gums (Mwangosi and Kiango, 2012).

Nigeria's National oral health policy indicated the need for oral health to be included as a component of health promotion and must be provided in antenatal care services (Federal Ministry of Health, 2012) and emphasis has been placed on integrating oral health promotion in maternal and child care among African Countries (WHO, 2016).

In Uganda, the prevalence of oral diseases among women was the highest at 42.4% compared to general population (WHO, 2014), 67.0% pregnant mothers having periodontal diseases (Wandera *et al.*, 2012), 86.0% postpartum mothers with plaque deposits (Muwanzi *et al.*, 2014). Uganda has emphasised that appropriate promotion of oral health requires integration of oral health policy element, strategies and policies of all sectors to impact community health, including maternal and child health (MoH, 2007).

In Moyo district, there is limited data on the level and factors associated with adoption of Oral health promotion by antenatal care providers.

1.2 Background to the Study Area

Moyo district is located in the North western Uganda, commonly known as west Nile, bordering Southern Sudan to the north, Adjumani District to the south and Yumbe district to the west. According to National Housing and Census (2014), the population of the district is 137,489 (UBOS, 2014).

There are 12 government aided health centre IIIs, 1 health centre IV and 1 general hospital. 4 private/NGO dispensaries, 4 clinics, 2 private non for profit health centre IIIs and 1 private non for profit health centre IV. Antenatal care services are available in all Health centre IIIs, Health centre IVs and the district general hospital.

Uganda Demography and Health surveys showed that Moyo is one of the rural districts where 97% of the women receive ANC services and from skilled providers with about 58% of them having at least four ANC visits (UBOS, 2017).

Some of the Dental services that are supposed to be provided in Moyo district include; minor oral surgical procedures, restorative dentistry, orthodontic treatment, periodontal procedures and Dental community outreaches and oral health promotion. The district has persistent under reporting of health data progressively over the years that has affected its placement in the national district league table, from being 2nd in 2002 to 102nd in 2012 (MoH, 2012).

According to Kumakech *et al.*, (2014), some of the major problems in the health sector in the district include; staffing, drugs stock out and delays in drug delivery, lack of transport facilities especially for referral purposes, absenteeism of health workers at health stations and inactive health unit management committees.

1.3 Problem statement

In Moyo district, there is limited data on the level and factors associated with adoption of Oral health promotion by antenatal care providers. Ideally, Oral health promotion is expected to be integrated in maternal and child health (WHO, 2016), with more emphasis on implementation of the National Oral Health Policy, that all districts should establish comprehensive oral health system for promotion and prevention of oral diseases (MoH, 2015).

Despite emphasis by WHO, Ministry of Health, and recommendations from different researchers within Uganda and beyond on the need to adopt or integrate oral health promotion into antenatal care services, the level and factors influencing adoption of oral health promotion by ANC providers in Moyo district is not known and if no action is taken this may lead to increased respiratory and cardiac infections, sleep and nutrition disturbance, poor pregnancy outcomes including preterm and low birth weight, poor oral hygiene status and increased development of early dental caries.

Therefore, the researcher seeks to establish factors influencing adoption of Oral Health promotion by Antenatal care providers in Moyo district.

1.4 Main Research Question

What factors influence adoption of oral health promotion by Antenatal care providers in Moyo district?

1.4.1 Specific Research Questions

1. What is the level of adoption of oral health promotion by the antenatal care providers in Moyo district?
2. What knowledge influences adoption of oral health promotion by antenatal care providers in Moyo district?
3. What attitude influences adoption of oral health promotion by antenatal care providers in Moyo district?
4. What practices influences adoption of oral health promotion by Antenatal care providers in Moyo district?
5. Do Health facilities have the capacity to adopt oral health promotion in antenatal care units in Moyo district?

1.5 Theoretical Model

In this study, both Diffusion of Innovation theory and Burke-Litwin Model (1992) were used.

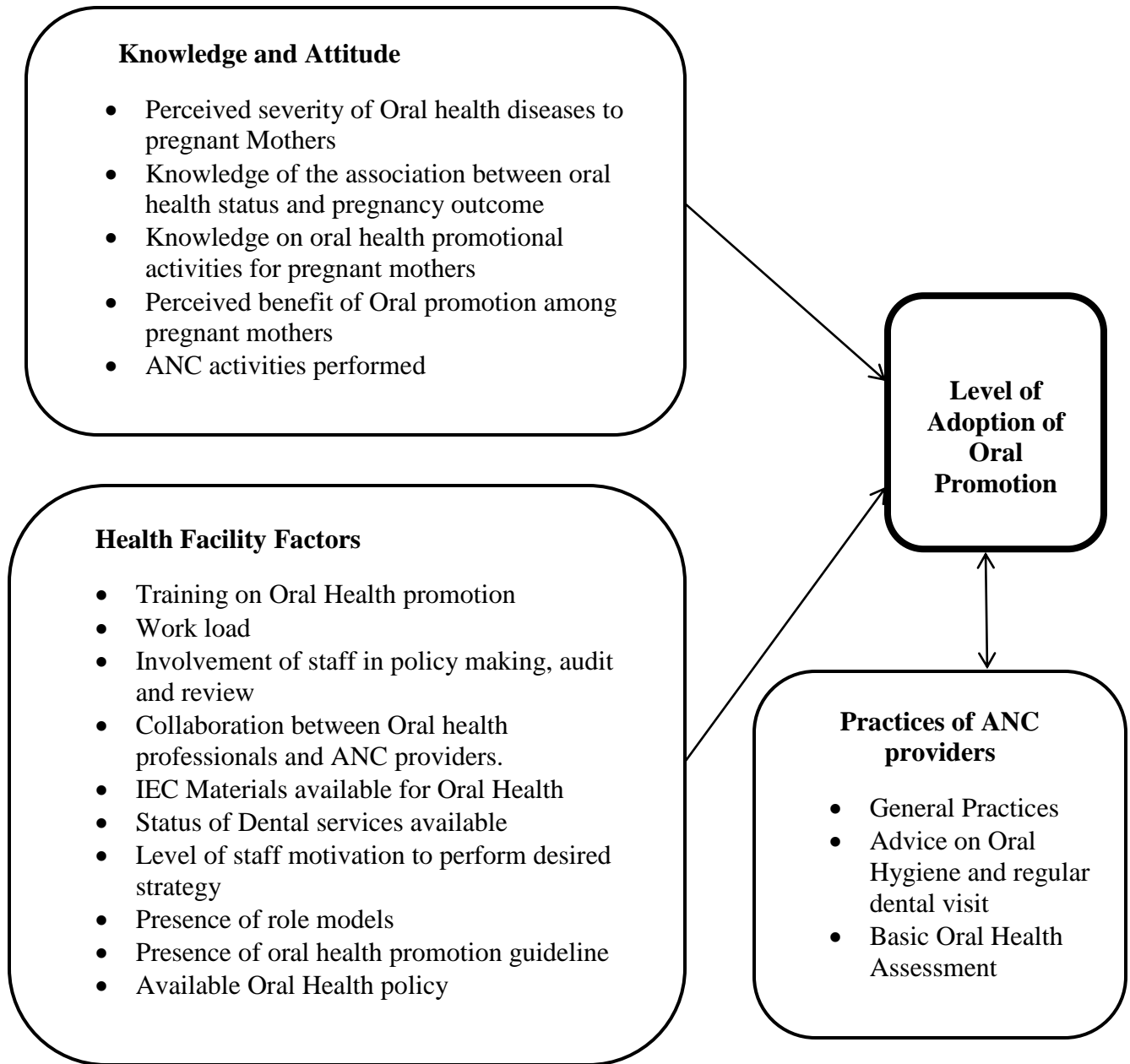
The "Burke-Litwin model" is a model of organizational change and performance. It provides a link between an assessment of the wider institutional context, the nature and process of change within an organization. Burke-Litwin looked at systems like organizational policy, how managers use human and material resources, expectations and feeling of staff, tasks required, individual skills, knowledge and abilities needed, leadership; that is who provides overall direction of the organization/act as role models, Organizational culture- values, customs and principles that guide the organization (Burke and Litwin,1992).

From this model the study applied constructs of human and material resources, expectations, skills, ability and leadership to elicit the capacity of health facility and adoption of oral and dental health promotion.

The diffusion of innovation theory as revised by Everett Rogers in 1995 shows how individuals and organizations adopt innovations or practices and in the context of this study, it shows how individuals and health facilities adopt oral and dental health promotion in ANC services and showing how successfully innovations spread gradually from few early adopters to the general population.

In this theory, the study applied awareness of new innovation (Knowledge), attitude and engaging in certain activities that would help participants to either adopt or reject the new practice and resources required to specifically answer and the first and second objectives. The innovation can however be influenced by the number of factors and that can later contribute to the modification of the innovation.

1.6 Conceptual Framework



1.7 Goal of the Study

The goal of the study is to contribute to the improvement of general health status of mothers and their children through adoption of oral health promotion in ANC services.

1.8 Aim of the Study

The aim of the study is to investigate factors influencing adoption of oral health promotion by ANC providers which will contribute to improved quality and sustainability of proper oral hygiene practices among pregnant mothers in Moyo district by establishing effective solutions to integration of oral health promotion by Antenatal care providers.

1.9 Objectives of the Study

1.9.1 General Objective

To establish factors influencing adoption of oral health promotion by Antenatal care providers in Moyo district.

1.9.2 Specific Objectives

1. To determine the level of adoption of oral health promotion by Antenatal care providers from August to September 2017 in Moyo district.
2. To determine the knowledge influence adoption of oral health promotion by antenatal care providers from August to September 2017 in Moyo district.
3. To determine the attitude that influence adoption of oral health promotion by antenatal care providers from August to September 2017 in Moyo district.
4. To determine practices that influence adoption of oral health promotion by Antenatal care providers from August to September 2017 in Moyo district.
5. To assess the capacity of health facilities to adopt oral health promotion in antenatal care units from August to September 2017 in Moyo district.

1.10 Justification of the Study

The Ottawa Charter defined health as “resource for everyday life, not the objective of living” and health promotion as “the process of enabling people to increase control over, and to improve their health” (WHO, 1986) and every individual has a right of access to essential components that include, education concerning prevailing health problems and the methods of identifying and controlling them (WHO, 1978).

The Vision of Oral Health according to the National Oral Health Policy of Uganda is to establish comprehensive oral health system fully integrated in general health based on primary health care, with emphasis on oral health promotion and prevention (MoH, 2007) and sensitizing non-dental health workers on public oral health (MoH, 2015).

Mothers are considered as cornerstones to children’s learning and their oral health knowledge and oral health status affect children’s oral health and opportunity to promote oral health through mothers is best during ANC as they are eager to learn new behaviours (Raj and Vaibhav, 2012).

Strengthen community action: This research will help both pregnant mothers and Antenatal care providers to own the program as they were fully involved in suggesting required messages and activities that may be needed for adoption of oral health promotion.

Reorient Health Services: This study emphasized shared responsibility for health promotion among ANC providers and dentists, government and private health facilities towards a health care system that contributes to the pursuit of oral health for pregnant mothers.

Develop Personal Skills: Provision of oral health promotion activities like Health education, prevention and protection will lead to development of personal skills of the ANC providers and pregnant mothers who will later pass the same skills to their children so that they are able to improve and take control over their health.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

In this chapter, related literatures to the topic of the study were reviewed to identify gaps and lessons learnt from those studies in order to establish the need for the study. It is arranged logically following the objectives of the study.

2.1 Knowledge influencing adoption oral health promotion by Antenatal care providers

A study conducted by Yazdani *et al.*, (2013) in Iran indicated that midwives had limited knowledge on oral health for pregnant mothers; this adequacy in knowledge among midwives who encounter pregnant mothers in the daily activities affected their role in oral health education and therefore need to improve their knowledge through incorporating oral health promotion into school curriculum.

Obstetricians also have daily opportunity for interacting with pregnant mothers and a study conducted among this cadre in Brazil showed that they were knowledgeable about the association between gingival inflammation and pregnancy outcomes and had negative attitude about getting involved in initiating oral health promotion for pregnant mothers (Rocha *et al.*, 2011).

In addition, a study conducted by Poornima *et al.*, (2015) among paediatricians found that 64% of them had limited knowledgeable about prevention of the dental caries by use of fluoride dentifrices and dental sealants, implying that there is need to develop oral health promotion information that would ably help improve the knowledge of paediatricians on dental oral health care for pregnant mothers. Having the opportunity to constantly interact with pregnant mothers

requires adequate knowledge on oral health for this professional cadre so that they would be able to give informed messages that are geared towards improving the dental and oral health of pregnant mothers.

Furthermore, knowledge of the ANC providers on the safety of prenatal dental services has been assessed through several studies including a study conducted by Lee and Shin (2017) to ascertain the safety of local anesthetics, it was found that it is safe to use local anesthetics in pregnancy although with some negligible adverse effect, these effects according to Lee *et al.*, (2016) include immune response-mediated allergic reactions and others that are unrelated to the immune response and these allergic responses are very rare in practice.

In addition to the above, study on safety about the use of local anesthetics, amalgams, x-ray scan, plaque removal, dental scaling and polishing and tooth extractions during pregnancy by Wrzosek and Einarson (2009), it was confirmed that all mentioned dental procedures do not have adverse pregnancy outcome. The challenge is to find out whether ANC providers are knowledgeable about the safety of the procedures during pregnancy

More still, a study conducted by Boggess *et al.*, (2011) found that there was relationship between maternal oral flora and child oral health and this relationship is thought to be caused by the transmission of streptococcus mutans from mother to child. Maternal behaviours including attention to oral hygiene and dietary practice may influence this risk of dental and oral health diseases.

In addition, a study by Vinay *et al.*, (2017) among nurses showed those who had undergraduates papers had adequate knowledge on the basic oral structure and identifying oral diseases, however, few of them were able to help patients with tooth brushing, visits to dentists. This study

explained more about the association between level of education and oral health knowledge and confirmed Nurses who had bachelor's papers were more knowledgeable.

Among primary care providers, a study conducted by Bhoopathi *et al.*, (2014), showed that only one-tenth of them had high knowledge regarding oral health, implying that the majority had limited knowledge about oral health.

A study by Dhulipalla *et al.*, (2016) among medical practitioners in India showed that young and inexperienced medical practitioners had better knowledge on periodontal diseases compared to their counterparts who had spent more years in work, implying that in this study work experience did not have an effect on the knowledge of the medical practitioners. Also the young practitioners might have had better training about oral diseases compared to those who were before them.

Several literatures showed that is association between physiological and prenatal dental diseases and a study conducted by Patil (2013) to show whether physiological changes take place among pregnant women had effect on oral health, it was found that in pregnancy various physiological changes take place around the female body and these brings about several changes in the oral cavity leading to increased level of dental or oral health diseases compared to the general population.

This literature review also focused on the link between poor oral health and cardiovascular diseases and a study by Sanchez *et al.*, (2017) showed that there was a link between dental diseases and cardiovascular diseases, therefore clinicians and nurses should be appropriately trained to promote oral health in their practice so as to reduce this vice. Finding whether the

ANC providers are knowledgeable of the fact that oral and dental diseases may lead to cardiovascular diseases in crucial.

A study by Budhathoki *et al.*, (2017) found that Barriers for healthcare engagement including knowledge and education are strong factors that influence, make and enact healthcare decisions, implying that there is need to provide oral Health literacy for ANC providers so that they are able to access and use oral health information for pregnant mothers so as to improve prenatal oral care.

Another study conducted by Shenoy *et al.*, (2009) among gynaecologists showed that the majority of them were not knowledgeable about the fact that periodontal disease among pregnant mothers is associated with pre term and low birth weight babies.

According to Patil *et al.*, (2010), majority of the medical practitioners were not knowledgeable about the fact that dental caries is infectious and could be transmitted from mother to child. However, they had inadequate knowledge about the relationship between oral and dental diseases and other parts of the body.

In another separate study conducted among Gynaecologists in Gujarat, the majority of them had good knowledge on oral health for pregnant mothers, although there was more need for emphasis and active participation and involvement by gynaecologists and paediatricians in continuing oral health education programs (Shah *et al.*, 2013).

In addition to the above, a study Shearer *et al.*, (2011) found that poor maternal oral health increases the risk of babies' developing early dental caries and this is linked to adverse pregnancy outcomes such as preterm birth and birth of low birth weight babies. However,

finding the knowledge of ANC providers on the link between adverse pregnancy outcome such as preterm babies and periodontal disease is very important as these may guide them to put appropriate measures to reducing the adverse outcome.

More importantly, Knowledge of ANC providers on the need for incorporating oral health component into prenatal services necessitates coordination between dental providers and front line health care providers such as pediatricians, midwives and nurses (Douglass *et al.*, 2009). Knowledge would include the fact that maternal oral and dental care need to receive priority as mothers' health has major influence on their infant's health (Boggess and Edelstein, 2009).

A study conducted by Sharif *et al* (2016) revealed that Nurse in Malaysia had limited knowledge about perinatal oral health coupled with some scores of misconception, although there was a good attitude towards oral health care for pregnant mothers.

Ajesh *et al.*, (2016) showed that among the midwives in Australia, greatest improvement in knowledge occurred in key areas vital in promoting maternal oral health and its effect on birth and baby, confidence in introducing oral health into antenatal care and referring women to dental services after undertaking an education program.

According to Golkari *et al.*, (2013), health care workers are knowledgeable about periodontal disease and the association it has with adverse pregnancy outcome, this implies that they could use the knowledge they have to educate pregnant mothers on the need for and how to practice proper oral hygiene and do regular dental check-up.

Dental care during pregnancy is an important aspect for both mother and infant (Deshpande *et al.*, 2015). There is need to integrate oral health screening through routine antenatal check-up

and develop guidelines for dental care to improve the oral hygiene of pregnant women (Morad *et al.*, 2017).

Periodontal disease is believed to affect the maternal and fetal immune responses systemically, leading to premature labour and there is more evidence that oral bacteria may translocate directly into the pregnant uterus, causing localized inflammation and adverse pregnancy outcome in the presence or absence of clinical periodontitis (Han, 2011).

In western Sydney Australia, 59.3% of pregnant mothers had dental problems during pregnancy, less than a third of those pregnant visited dentists; only 10% receive information about perinatal oral health and were unaware of the potential impact of poor maternal oral health on pregnancy and infant outcomes (Ajesh *et al.*, 2013).

In order to review the influence of demographic factors on knowledge, Sharif *et al.*, (2015) carried out a study among Nurses and he found out that there was no relationship between age, numbers of years spent in the services and their knowledge on prenatal oral health care.

A study carried out to examine the knowledge and attitude of Doctors, medical students and Nurses in Nigeria revealed that as much as the majority of the Nurses claimed to be knowledgeable about oral health care, the general findings showed that there was low knowledge and attitude (Oyetola *et al.*, 2016).

A study by Smadi and Nassar (2016) among Nurses students revealed that they had very low oral health care knowledge and suggested a need for incorporating nursing curriculum with effective oral health care training in order to equip Nurses for the task ahead of them, including promotion of oral health among patients.

A study by Ka *et al.*, (2015) to assess the knowledge and attitude of medical doctors in Nigeria on oral health care revealed that senior medical doctors had positive attitude about periodontal health and poor knowledge on the same disease and the risk factors associated to the disease.

Oral health care knowledge on promotion among antenatal care providers seems to be varying across different cadres and countries. The analysis herein focused on the knowledge of Nurses, Midwives, general medical practitioners and gynaecologists among others also to some extent looking at which professional cadres are more knowledgeable on oral health care or promotion for pregnant mothers.

In this study, antenatal care providers included Midwives, Nurses, Clinical Officers, Medical doctors, Gynaecologists and Obstetricians that is why the review of the literature on knowledge and other related factors coming after majorly focused on the same cadres.

Shah *et al.*, (2013) indicated that gynaecologists understood how oral health of the mothers was important during pregnancy and firmly believe that they have an important role in the promotion of oral health and had shown interest in attending program on oral health.

2.2 Attitude of Antenatal care providers on adoption of oral health promotion

Wilder *et al.*, (2007), noted in a survey conducted in North Carolina that Obstetricians had misconceptions about the fact that pregnancy increases the chances of oral health problems, including tooth decay and only half of them were involved in recommending dental examinations during pregnancy. Obstetricians have the opportunity to meet pregnant mothers daily in their practice and having misconception about increased prevalence periodontal diseases among pregnant mothers may remarkably prevent them from paying attention to initiating preventive measures geared towards reducing oral health challenges among pregnant mothers.

A study carried out in Australia among dentists revealed that the majority had positive attitude about the need for encouraging pregnant mothers to receive regular dental check-up, this was however affected with the perception that very few of the counterparts are knowledgeable about oral health promotion in pregnant mothers (Ajesh *et al.*, 2017).

In addition, a study conducted by Rabiei *et al.*, (2014) showed that despite of the fact that some Nurses belief in their essential role in preventing oral diseases only half of them believed that their oral health care would be effective. However, Nurses who were more knowledgeable were willing to learn and receive more training on oral health care and showed more positive attitudes.

Furthermore, a study conducted by Heilbrum-Lang *et al.*, (2015), to show the perspectives of Midwives to promoting oral health among pregnant women, indicated that Midwives had positive attitude and revealed that it would be feasible to incorporate oral health into the first antenatal booking visit and also recognized that oral health promotion was within their scope of practice.

In Australia, a study among antenatal care providers revealed that majority of them had positive attitude and agreed that maintaining oral health during pregnancy was important and that pregnant women should receive a dental check-up early in their pregnancy. Some of them felt they had the skills to provide oral health advice to pregnant women and that pregnant women are more likely to seek dental care if their ANC providers recommend it (Ajesh *et al.*, 2016).

In the same study conducted by Ajesh *et al.*, (2016) one of the barriers to adoption of oral health promotion for pregnant mothers was that 59.0% of the antenatal care providers had negative attitude and reported having lack of time to provide oral health advice to pregnant women, and concerns about the safety of dental procedures during pregnancy.

In addition, another study about some of the barriers to prenatal dental care conducted study by Lee *et al.*, (2010) showed that some of the barriers to providing dental care during pregnancy among others included the perceived time and economic costs. Overcoming these attitudinal barriers to prenatal care like perceived lack of time and high economic costs would be vital in reducing oral burden among pregnant mothers.

A study carried out by Bahramian *et al.*, (2018) also showed misconception and negative attitude on oral health care and health care providers tend to focus on barriers instead of opportunities and some of majors barriers included lack of knowledge and misconceptions, high dental care costs, psychological conditions including fear, lack of time and willingness of dentists to accept treatment for pregnant women.

In Malaysia, a study conducted by Sharif *et al.*, (2015) among Nurses showed that the majority (99.3%) had positive attitude on oral health care for pregnant mothers and openly declared that they were willing to receive more training in order to effectively perform the required prenatal oral health care.

2.3 Practices that influence adoption of oral health promotion by antenatal care providers

2.3.1 General practices

Study conducted by Shenoy *et al.*, (2009), revealed that about 85% of the gynaecologists referred their patients or pregnant mothers to the dentists, implying that they were involved in oral health promotion activities for pregnant mothers as referral of pregnant mothers to dentists is one of the oral health promotion strategies.

Aggarwal *et al.*, (2014), found that although obstetricians were knowledgeable about appropriate dental care practices during pregnancy as well as the relationship between oral health and

pregnancy outcomes, this knowledge often did not translate into appropriate practice. Having knowledge and not putting it into practice may not be able yield appropriate result of reducing oral health diseases among pregnant mothers.

In addition, Kloetzel *et al.*, (2011) also noted that women's health providers should understand the importance of protecting them from diseases during oral health during pregnancy and educate their patients accordingly, it was not clear whether they had put what they was understood into practice of prenatal care.

A study conducted by Shah *et al.*, (2013) among gynaecologists to assess their practice in relation to oral health care for pregnant mothers revealed that, 42.1% of them had recommended the use of fluoridated tooth paste and 62.6% advised twice a day teeth brushing to their patients, with 87.9% of them being aware of the side effects of gum or periodontal disease.

In another practice according to a study conducted by Zanata *et al.*, (2008) it was found that most antenatal care providers referred pregnant mothers to dental care only when they mentioned the source of their problem as dental problem and this was a great barrier to the adoption of a preventive approach, meaning that whoever did not mention any oral health challenge was not helped to understand the preventive measures of prenatal oral diseases and this might have led to increased burden of oral health diseases among the subject group.

A study by Rainchuso (2013) showed that routine dental care was often avoided due to the fact that most health care professionals only agree to the importance of good oral health in every stage of life including pregnancy and they do not clearly explain the issue.

Another study conducted by Ajseh *et al.*, (2016) among antenatal care providers in Australia showed that they were willing to discuss oral health if they have appropriate education or training and information was given to them on oral health promotion program among pregnant mothers and those who had appropriate knowledge and training on the subject matters were actively engaged in prenatal oral care.

In another study to ascertain the practice of Midwives on prenatal oral health promotion, it was found that some of them were informing pregnant women in their care about pregnancy gingivitis, almost all midwives gave recommendations about caries prophylaxis and risk for developing ECC to the pregnant women and mothers including recommendations concerning regular dental visits (Ehlers *et al.*, 2014).

Simple measures such as maintenance of good oral hygiene, diet modification, having regular dental check-ups help in decreasing the likelihood of transmission of infection from mother to child and ultimately reduce the risk of early childhood caries, thus, there is growing evidence that good oral health of the mother right from the pregnancy could be key to establishing good infant oral health (Chacko *et al.*, 2013).

A study conducted among Midwives in Ghana on Health promotion indicated that some of practices they engaged in included; advising and education of pregnant mothers on management of weight, infection control, screening for hazardous and harmful substances including alcohol and smoking and personal hygiene (Awusu-Addo, 2015).

2.3.2 Advise on Oral hygiene and regular dental visit

Some ANC providers always discuss the importance of oral health with pregnant women and advised women to visit dentists early in their pregnancy, with Very few of them always providing counselling regarding the association between poor maternal oral health and birth outcomes or caries transmission (Ajesh *et al.*, 2016).

In addition, a study carried out by Wagner and Heinrich-Weltzien (2016) in German revealed that Midwives practice during prenatal oral care involved; recommendations regarding the implementation of oral hygiene and the referral to a dentist during pregnancy and childhood, with some few them offering advice about the frequency of tooth brushing and the dosage of toothpaste.

In the same study by Ajesh *et al.*, (2016) in Australia, antenatal care providers who had limited knowledge on maternal oral health were discussing the importance of oral health or advising women to visit a dentist. ANC providers who were more knowledgeable about maternal oral health had training and information were more engaged in practices addressing the oral health of pregnant women

Interestingly, the relationship between maternal oral flora and health and child oral health is thought to be caused by transmission of *Streptococcus mutans* from mother to child and therefore antenatal care providers' advise for change of maternal behaviours, including attention to oral hygiene and dietary practice may also influence the risk of developing oral diseases during pregnancy and a possible effect on the baby (Boggess *et al.*, 2011).

Another important practice among antenatal care providers as highlighted by Chacko *et al.*, (2013) included simple measures such as; advise on maintaining of good oral hygiene which were helpful in decreasing the likelihood of transmission of infection from mother to child and ultimately reduces the risk of early childhood caries

2.3.3 Emphasis on Nutrition

In relation to practice of antenatal care providers about nutrition, a study conducted by Tanaka *et al.*, (2012) indicated that major practices should involve continual promotion of dietary intake of Calcium among pregnant mothers as this was associated with decreased prevalence of periodontal disease.

According to Sokal-Gutierrez *et al.*, (2016), early Childhood caries are associated with the type of foods that a child is fed on since infancy, therefore helping mothers during ANC visits about proper nutrition would help mothers to know required foods for their children hence reducing early childhood caries.

A meta-analysis by Avila *et al.*, (2015) showed that breastfed children were less affected by dental caries than bottle fed children with evidence that breastfeeding can protect against dental caries in early childhood. Therefore, antenatal care providers have the task of educating mothers on exclusive breastfeeding so as to reduce early dental caries.

Additionally, according to Payne *et al.*, (2014) nearly all midwives were asking and advising mothers on effects of alcohol consumption in pregnancy, showing the need for limiting alcohol intake during pregnancy. Advising pregnant mothers on limiting alcohol is one of the aspects of routine antenatal care services and it also plays vital role in promoting oral health.

A healthy diet is an essential part of the process of oral care needed for development of teeth and long-term oral health, right food choices and healthy eating habits must begin before pregnancy and good dietary or oral hygiene habits should continue during the entire pregnancy (Leong *et al.*, 2013).

Jones *et al.*, (2011) revealed that midwives were reluctant of discussing the risks of prenatal alcohol exposure to the fetus because they did not want to distress women and perceived a lack of knowledge and evidence in the area.

A study conducted by Arrish *et al.*, (2017) among midwives practices on prenatal oral care show that few of them were advising pregnant mothers on nutrition, although they all believed that it is vital to promote oral health of the pregnant mothers through nutritional education sessions.

Generally, emphasis on nutrition is in the current antenatal care guideline of WHO (2016) and various studies showed changes in nutritional status of pregnant mothers including studies conducted by Priet *et al.*, (2011) which showed generalised iodine deficiency during pregnancy and that it requires health promotion programs for pregnant mothers.

A study by Lucas *et al.*, (2014) revealed that few Midwives were giving education on nutrition for pregnant mothers although they knew nutritional education would be important to health of both the mother and the baby. Providing education on nutrition during antenatal care would help improve the dietary and nutritional knowledge of pregnant mothers.

According to Kumera *et al.*, (2015) a study conducted in Northwestern Ethiopia revealed that pregnant mothers attending antenatal care services should be educated on nutrition and having diversity of diet as increase nutritional knowledge among them would enhance their practice regarding the consumption of Zinc rich food foods that would be helpful to their general health.

A study carried out in India within antenatal care clinics revealed that antenatal care providers practiced in system screening, treatment and follow-up care for anemia and iron deficiency among pregnant mothers and but did not participate in advising and follow-up of mothers who used tobacco. However, they were interested in integrating the practice of tobacco screening and cessation in antenatal care services (Mistry *et al.*, 2018).

2.3.4 Basic Oral health assessment

A study by Wooten *et al.*, (2011) in North Carolina, showed that Nurses and Midwives frequently met and examined pregnant mothers and this put them at a better position to carry out oral health screening for this group, coupled with the fact that there is limited number of dentists and public health dental officers who rarely interface with the pregnant mothers.

In a study conducted by Tetuan (2004) about the role of Nurses in Oral health, he concluded that Nurses have great potential for incorporation of oral health assessment and screening in their practice as much as they are given the required knowledge and skills.

According Clemmens and Kerr (2008) in United States of America, the "National Call to Action to Promote Oral Health in 2003 put strong emphasis on the need for partnerships especially involvement of nurses in oral disease prevention as they are in perfect position to provide health promotion education and screening.

2.4 Capacity of Health Facilities to adopt oral health promotion in antenatal care units

2.4.1 Workload among ANC Providers

Integration of oral health promotion is an important aspect of ANC as both oral health and general health of pregnant mother and the baby are crucial and this may be more effective and efficient than targeting a single disease or condition (Rogers, 2011).

In general practice, Dentist, Dental assistants and public health dental officers available are limited at government facilities, only 13% are available according to Annual Health Sector performance Report 2014/2015 (MoH, 2015), this implies that they alone may not manage to promote oral health for vulnerable groups that include pregnant mothers with whom they do not have open access to interact compared to the ANC providers.

Naicker *et al.*, (2010) revealed that there is lack of personnel in health facilities indicating doctor to population ratio in Nigeria as 3 per 10,000 compared to that of United States of America which stands at 26 per 10,000, about 13,272 physicians trained in sub Saharan Africa are practicing in Australia, Canada, United Kingdom and the United States of America.

The HSSP III, 2010/11- 2014/2015 revealed that there is a shortage of health workers and skill imbalance within healthcare in Uganda as it is the case in other developing African countries and the situation is worse in the rural health facilities compared to that of urban areas (MoH, 2010).

Decreased job control and increased negative influence of job demands on private life over time seem to be the most important work factors associated with reduced work ability among young workers of both sexes. Increased social support at work, increased job control, and decreased negative influence of job (Bostrom *et al.*, 2012).

According to Hoang *et al.*, (2018) in a global Nursing conference conducted in United States of America, it emerged among others that some of the barriers to oral health care by practitioners included lack of time and oral health training and competing priorities and workload.

A study conducted in Netherlands to assess the effect of workload and stress on the quality of practices revealed that, the more the staff workload, the lesser the practice and therefore providing more time and reduced workload increased the level of better performance practices and better quality of staff members (Homborgh *et al.*, 2009).

2.4.2 Collaboration between Oral health professionals and ANC providers

According to George *et al.*, (2012), there was no common understanding between dentists and prenatal care providers in respect to oral health care during pregnancy and this may be a challenge in achieving adoption of oral health promotion.

Dental caries is the most prevalent oral health challenge among children, including pregnant mothers and incorporating oral health promotion into ANC services by medical authorities will not only save lives of the pregnant mothers but also that of the babies (Sheikh, 2015).

A study by Abou El Fadl *et al.*, (2016) revealed that incorporating oral health promotion into nursing and midwifery practice is a promising initiative for reducing oral health disparities contributing to a downward trend in caries experience and increased access to dental care.

According to McDonald *et al.*, (2012) Collaboration across organizational boundaries remains challenging, power dynamics and trust affect the strategic choices made by each health professional about whether to collaborate, with whom, and to what level. These decisions directly influence inter-professional relationship; trust and respect can be fostered through a mix of interventions.

Inter-professional collaboration education model for dental and medical providers is needed and provision of appropriate referral system for comprehensive clinical care of pregnant patients and accredited standards that encourage development and implementation (Maree *et al.*, 2015).

Given the possible association between maternal and infant oral health, and between periodontal infection and general health, antenatal care providers should collaborate with dentists to encourage all pregnant women to comply with the oral health professionals' recommendations regarding appropriate dental brushing techniques and the importance of dental visits (Villa *et al.*, 2013).

According to a hand book developed by Dempsey *et al.*, (2011) about the importance of collaboration among different professional cadres, sectors, including partners, in order to enhance sustainability in health promotion the need for effective collaboration and working together among different work disciplines should be emphasised.

According to Harnagea *et al.*, (2017) the facilitators to integration of oral health in primary health care included supportive National Oral health policies and adequate allocation of resources, interdisciplinary actions, collaboration between dental staff members and other healthcare professional cadres, presence and active participation of local leaders.

According to Supper *et al.*, (2014) in order to have appropriate interprofessional collaboration in primary care appropriate criteria must be put in place and in their study they affirmed that common interest different professional cadres in regards to collaboration, perception of having an opportunity to improving quality of care and development of new professional fields. Some of the challenges they highlighted in their study included lack of awareness and clear definition of

roles and competences, inadequate information sharing, fear of confidentiality and lack of team building.

2.4.3 IEC Materials available for Oral Health

According to the World Health Organization (1998) report for the oral health in the African regional strategy, appropriate information should be provided to individuals, families and communities for the promotion of healthy oral health behaviour and lifestyles, there is need to involve people developing oral health education, promotion and information materials that should be availed at different health facilities and departments.

A study by Quinonez and Boggess (2013) indicated that oral health promotion program should consist of training materials, including videos on oral health education for non-dental health care providers and pregnant women, and access to a prenatal-focused oral health education website.

According to Kolisa (2013) among Nurses on oral health promotion services offered as part of maternal and child health services revealed that Nurses had several work-related challenges related to providing integrated oral health education during antenatal or maternal care and one of the majors constraints was inadequate information communication and education materials.

In South Africa, some of the work related challenges among Nurses to providing oral health education for pregnant mothers included shortage of IEC materials (Kolisa, 2016).

A study by Parker *et al.*, (2012) reveled that patients do not need IEC materials that would require much reading and therefore IEC materials for health promotion should include posters, pamphlets and booklets with simple and clear information that are easily understandable to the target population.

2.4.4 Status of the available Dental Services

Baseer *et al.*, (2012) revealed that more than 65% of the health professionals said that the dentist should explain the procedure before treatment, have a caring attitude toward patients and, most of the times, the dentist cared about treatment rather than prevention of oral diseases.

A study conducted among Antenatal mothers on utilization of dental services in Malaysia showed that there is dissatisfaction with the services rendered hence aiding negative perception to seeking oral care by (Saddki *et al.*, 2010).

In most cases the cost of dental services were believed to be high and this is a common challenge preventing pregnant mothers from consulting oral health professionals, especially those women who are from low-income families (Ajesh *et al.*, 2011).

In addition, a study conducted by Nyamuryekung'e *et al.*, (2015) in Tanzania showed that dental services were more expensive compared that of Democratic Republic of Congo. Availability of dental equipment, skills of dental practitioners and cost of the available services was associated with dental care utilization

More study on the status of dental facilities by Sanchez *et al.*, (2017) revealed that, the main barriers preventing patients from seeking oral health care among others included lack of awareness, high cost of dental care and difficulties in accessing the public dental service. This calls for creating awareness among the people in all age groups and gender so that dental challenges would be reduced by promotion of better practices.

A study carried out by Ajesh *et al.*, (2012) in Australia also indicated that, there were several barriers preventing pregnant women from seeking dental care and these barriers included; lack of dental awareness, high treatment costs and misconceptions about dental treatment during pregnancy.

A systematic review by Vieira *et al.*, (2015) to assess the knowledge and attitude of dentist on oral health care of pregnant mothers revealed that, there was doubts and fears among them regarding oral health during pregnant especially the use of X-rays, prescriptions and other treatments.

It appears that most dental units in the different countries were almost having the same challenges ranging from high cost of dental services, lack of awareness and misconception. However some countries have incorporated oral health promotion in prenatal care and this has improved the knowledge of pregnant mothers and also health insurance covers for dental health to solving challenge of high dental care costs.

Status of dental units would either lead to increased utilization of the services by pregnant mothers or drastically limit dental utilization if dental service costs are high and dentists have misconception about the usage of dental care during pregnancy.

2.4.5 Level of staff motivation to perform desired strategy

According to a study conducted by Ayamolowo *et al.*, (2013) a healthy work environment for nurses in the primary health care settings is an important factor in improving work satisfaction, reducing turnover intention and improving nursing care outcomes.

There are common areas of health worker motivation that should be considered by managers and policy makers, particularly the importance of non-financial motivators such as working environment and skill development opportunities (Peters *et al.*, 2010).

A Study carried out by Bradley and McAuffe (2009) in Malawi indicated among Mid-level health care providers in emergency obstetric and new-born indicated that insufficient financial remuneration had a negative impact on retention and performance.

A systemic review conducted by Okello and Gilson (2015), it was revealed that work place trust interaction and cooperation among health care workers have a direct link to intrinsic motivation, and the more staff members are motivated among each other the more they willing to adopt new innovations that continues to help them work together.

In a study conducted by Nguyen *et al.*, (2015), it was revealed that several factors contribute to motivation of maternal care providers, some of these include. Motivation was higher in health workers self-identifying as competent or who were enabled to provide more maternal care services.

Lack of resources including poor leadership were key factors leading to providers' weak workplace trust and contributed to often-poor quality services, driving a perverse cycle of negative patient-provider relations across the four sites (Topp and Chipukuma, 2015).

In addition, motivation is also realised by the staff members when they feel valued by their fellow staff members, a study conducted by O'Donnell *et al.*, (2010) among Nurses, it was reported that a good number of Nurses were sometimes feeling isolated in their work place and considered leaving the professional practice.

2.4.6 Involvement of peers of pregnant mothers

A study conducted by Nankunda *et al.*, (2010) showed that women expressed satisfaction with various aspects of peer counselling and those who had received five or more peer to peer sessions were more likely to give positive responses about their experience compared to those who had received less than five peer sessions.

Mothers are important figures in families and are cornerstones for children's learning, oral health knowledge, pattern of dental utilization and her oral health status affect child's teeth, oral health behaviour and attitude towards oral health, therefore need to develop oral health promotion targeting pregnant mothers is crucial (Raj and Vaibhav, 2012).

According to Ingram (2013), an introduction of targeted peer support is a very important aspect of psychosocial support for mothers and health professionals and continued support during antenatal and postnatal care services are very crucial. Ideally, peers understand their challenges better than anyone else and this put them at a better position have positive effect on their fellows when trained on the specific area where there is need.

It was noted by McLeis and Redshow (2017) that one on one peer support during and after pregnancy posed a positive impact on mothers' emotional wellbeing and encouraged each other to promise and value a particular intervention at hand for their wellbeing.

In a study conducted by Mens *et al.*, (2011) among pregnant mothers peer education led to increased knowledge on malaria and its prevention, involving pregnant mothers in promoting oral health would most likely lead to increased oral health among their fellow pregnant mothers.

Furthermore, peer support is very effective in disease control and prevention as complex behaviours could easily be influenced by fellow peers to new and desired behaviour to promoting a healthy life style other than using an external person who may not be able to understand the complex behavioural issues within the target group (Fisher *et al.*, 2017).

2.4.7 Policy guideline and implementation

According to Ajesh *et al.*, (2016), main barriers for ANC providers in promoting oral health was lack of practice guidelines on oral health care during pregnancy in Australia, insufficient training to perform oral health assessments on pregnant women and the high cost of dental treatment for pregnant women. This requires involvement of health care providers in making policies that are geared towards bridging the gap in prenatal oral health promotion that are regularly reviewed for effectiveness and efficiency.

Further research on policy by Shariff (2014) revealed that it is important to involve Nurses in health policy development and some of the key participatory roles in health policy development include mentoring, supporting and developing future nurse policy makers, these roles played by Nurses in policy formulation and dissemination is crucial in easing the effectiveness of the policy implementation as those involved may have the capacity to influence their peers.

In addition, Wandera *et al.*, (2012) showed in Uganda, there is need for local and national health policy to incorporate prevention of oral diseases during pregnancy as their study indicated that the height- for- age status at 3 weeks postpartum was worse in infants of mothers who had periodontal problems and poor oral hygiene during pregnancy.

A study by Rigo *et al.*, (2016), revealed that dental guidance during pregnancy influences the mother in the procedures of adopting oral hygiene to their children as factors that lead to dental decay are explained to them in this process. However, better oral health guidance during pregnancy requires practice guideline that would clearly indicate the necessary care required.

Additionally, a study by Harnagea *et al.*, (2017) showed that some of the factors that facilitated integration of oral health were supportive policies, interdisciplinary education, and collaborative practices between dental and other healthcare professionals.

Dental care during pregnancy is an important aspect for both mother and infant (Silk *et al.*, 2008) and there is need to developing guidelines for dental care that should emphasize improvement of oral hygiene of pregnant women so that they are helped to manage oral health of their infants (Ramazani *et al.*, 2014).

According to WHO (1986), health promotion advocates to involve all sectors at all levels in formulating policy and direct them to be aware of the health consequences of their decisions and to accept their responsibilities for health, health promotion policy requires the identification of obstacles to the adoption of healthy public policies and ways of removing them, thus health policies must focus on making it easy for beneficiaries to make healthier choices.

In addition, Boggess and Edelslein (2006) revealed that oral health care is a right for all individuals and regardless of the potential for improved oral health to improve pregnancy outcomes, public policies that support comprehensive dental services for vulnerable women of childbearing age should be expanded so that their own oral and general health is safeguarded and their children's risk of caries is reduced.

A study carried out by Riggs *et al.*, (2016) about promoting access to dental services for refugee women during pregnancy showed that midwives were having the appropriate knowledge and understanding about key priorities and policy that entitles pregnant women to receive dental care cost-free.

Furthermore, a study by Wagner and Heinrich-Weltzein (2016) revealed that, having uniform guidelines on oral health care and promotion would help increase oral awareness and to improve the oral health knowledge among midwives and all other health-care professionals.

In a study conducted by Riggs *et al.*, (2016), it was found that policy-to-practice gap is significant and if not addressed has the potential to widen oral health inequalities across the life-course. Policy gaps created right from its formulation to implementation may hinder its success and therefore any anticipated gap should be address beforehand so as to realize a better outcome of the policy.

A study carried out by Lee *et al.*, (2014) on strengthening health promotion in Hospitals showed that limited resources in the external environment and unavailable practice guidelines including lack of successful learning experiences regarding the required practices amounts to important barriers in implement health promotion.

2.4.8 Training on Oral health promotion

A study conducted by Golinveaux *et al.*, (2013) suggested that providing an interdisciplinary oral health educational program for paediatric nurse practitioner can improve their knowledge, confidence, attitudes, and behaviours regarding the incorporation of oral health care services.

Training is crucial in achieving oral health care for pregnant mothers and according to Rabiei *et al.*, (2014), physicians expressed willingness to implement preventive oral health activities in their practice and pursue further training, there is need for continuous medical education program in primary would be of help to the medical practitioners so as to enhance their practices towards oral health promotion.

Nurses who were enrolled in a study by Pesaressi *et al.*, (2014) also revealed that training would be very important for them and would be willing to actively participate in oral health programs after receiving the required training.

In addition, a study by Momanyi *et al.*, (2016) revealed that training of health workers was relevant to their tasks and helped them perform better due to the skills attained , more regular trainings of health workers and paying attention to discussing their career development prospects would be of great value

In study carried out by Egea *et al.*, (2013), it was revealed that it is necessary to strengthen the training of all health practitioners in oral health among pregnant mothers, design and implement a specific oral health strategy that could allow better identification of the patients at risk by the professionals of pregnancy, and optimize so the care of pregnant women.

According to Curtis *et al.*, (2013) the majority of the dental schools reported teaching prenatal oral health to their students, however, clinical exposure was limited. This signifies the need for more effort to include distribution of prenatal oral health guidelines/consensus statements to educators and learners, increasing exposure of dental students to pregnant patients, and developing faculty expertise among students.

Heilbrunn-Lang *et al.*, (2015), found among Australian midwives that, with relevant training it would be feasible and acceptable for them to incorporate oral health promotion within their practice and this explores and define the role of antenatal health care professionals in oral health promotion at a state and national level.

In a study conducted by Boutigny *et al.*, (2016), it was found that there was need for a better initial professional and continued education regarding pregnancy with emphasises on updating guidelines in health care practices for pregnant women so as to have more effective prevention of risk-related adverse pregnancy outcomes, such as pre-term birth or pre-eclampsia.

There was positive attitude and willingness to introduce oral health courses into the curriculum of undergraduate nursing teaching(Hahn *et al.*, 2012) and the need to incorporate an interdisciplinary, multifaceted oral health educational curriculum in a paediatric nurse regarding the inclusion of oral health assessments, consultations, preventive treatments and referral (Golinveaux *et al.*, 2013).

Generally, pregnant mothers are more predisposed of oral health diseases, poor oral health has adverse pregnancy outcomes and ANC providers in different parts of the world have adopted oral health promotion. However knowledge and attitude, practices and general capacity of health facilities pose a challenge.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the methods used to establish the factors influencing adoption of oral and dental health promotion.

3.1 Study Area

This study was conducted in Moyo district. The district has limited data on the level and factors associated with adoption of oral health promotion by ANC providers and high level (97%) of the ANC attendance, with 58% of them having at least four ANC visits (UBOS, 2017).

3.2 Study Design

Descriptive Cross-sectional study was used where both quantitative and qualitative methods of data collection and analysis were employed.

Concurrent data collection approach was used including information and the interpretation of overall results (Creswell, 2009), this design was used because of shorter data collection period and the need to provide comprehensive analysis of the research problem.

3.3 Study Population

The study population was antenatal care providers working in general hospital, Health Centre IVs and health centre IIIs within Moyo district that included Midwives, Nurses, Clinical officers, Medical Doctors, Health managers.

3.4 Study Unit

The study considered Antenatal care providers in both government and private non for profit health facilities in Moyo district where antenatal care was being offered.

3.5 Sample Size

Simplified formula for proportions by Yamane, (1967) was used to determine sample size of the ANC providers in the district for the study. This formula was used because the population (N) of the ANC providers in the district were known. The sample size (n) obtained was then used to determine the representative proportion of ANC providers for each health facility.

$$n = \frac{N}{1 + N(e)^2}$$

Where n = sample size, N = Number of Nurses, Midwives, Clinical Officers and Medical Doctors in the selected health facilities within Moyo district (245), e = Level of precision or sampling error (0.05). From the above formula, the sample size for the study shall be;

$$n = \frac{245}{1 + 245(0.05)^2}$$

$$n = \frac{245}{1 + 0.6125}$$

$$n = \frac{245}{1.6125}$$

$$\underline{\underline{n=152}}$$

Where n refers to the number of ANC providers considered for the study.

3.6 Sampling Technique

Both probability and non- probability sampling techniques were used. The probability technique was used for quantitative strand of the study, while non-probability was used in qualitative strand.

Stage one: Listing and selection of the health facilities

A complete list of health facilities in which ANC services were being offered, including list of the providers were obtained from the district human resource in charge of health for each health facility.

The district has one(1) general hospital, one(1) government health IV and one(1) private non for profit health IV and eleven (11) government health IIIs and two (2) non for profit HC IIIs in which ANC services were conducted. The general hospital and the two (2) health centre IVs were purposively selected for the study.

The list of all ten (10) Health centre IIIs both government and private non for profit were randomly selected and in total fourteen (14) health facilities were selected. In order to obtain appropriate number of respondents, nine (9) government and two (2) (Erepi and Fr. Bilbao private facilities) from the list of thirteen (13) HC IIIs in the district and in total Fourteen (14) (88%) of health facilities were selected.

Health facilities in which ANC was offered within the district included; Moyo General hospital, Obongi HC IV, Moyo Mission HC IV, Itula HC III, Laropi HC III, Palorinya HC III, Dufile HC III, Logoba HC III, Metu HC III, Eremi HC III, Aliba HC III, Lefori HC III, Eria HC III, Besia HC III, Fr.Bilbao HC III and Erepi HC III.

Stage two: Sampling the ANC providers for each selected health facility

Stratified sampling technique was used; the strata included each selected health facility and professional cadres; that is Nurses/Midwives, Clinical Officers and Medical doctors, then probability proportional to size was used to obtain the number of ANC providers to be interviewed from each health facility and for each professional cadre.

Moyo general hospital had the highest number (106) of ANC providers, therefore using proportion to size 65 respondents were selected for the study, from Obongi health centre IV 8 respondents were selected, for Moyo Mission, 11 were selected, from Fr. Bilbao 6 were selected, Erepi had 6 and from the 9 government health centres 56 respondents were selected.

Simple random sampling was used to obtain the required ANC providers after obtaining the list of every health worker who were working within the health facilities where antenatal care was offered, names or initials of the names of staff members were written on pieces of paper, shaken in a hat then randomly picked from the hat without replacement until the desired sample size for that facility and professional cadre was reached, those who fulfil the inclusion criteria and consent to the study were interviewed.

Purposive sampling- specifically Criterion Sampling (Palys, 2008) was used to select individuals who met specific criterion that included ANC providers who participated in FGD and Health managers.

ANC providers from three health facilities were requested to participate in Focus group discussion after consenting that included three focus group discussions of ANC providers.

3.7 Variables

3.7.1 Dependent Variable: Is adoption of Oral Health Promotion and it was measured using 24 items of practices related to oral and dental health care services by antenatal care providers.

ANC providers who mentioned doing up to three quarters $\frac{3}{4}$ (75%) or more than 75% of the 24 practice items were considered to have adopted oral health promotion for pregnant mothers. Using scale of 0-17 (0-70%) items to refer to non-adoption and scale 18-24 (75%-100%) referred to adoption of oral health promotion by ANC providers.

3.7.2 Independent Variables: Knowledge and attitude influencing adoption of oral health promotion and capacity of Health facilities to provide oral health promotion activities and strategies required to influencing adoption of oral health promotion by Antenatal care providers.

Knowledge: 15 items were used to measure the level of knowledge of the respondents on adoption of oral health promotion. ANC providers who scored less than 7 ($\leq 40\%$) were recorded to have low knowledge, those who scored 7- 10 (46.7% -66.7%) as having moderate knowledge and respondents who scored 73.3% and above were recorded to have had high knowledge on adoption of oral health promotion.

Attitude: For measuring attitude of the respondents 6 items were used, those who scored 3 ($\leq 50\%$) and below were recorded to have had negative attitude and respondents who scored 4 to 6 ($\geq 50\%$) were recorded to have positive attitude on adoption of oral health promotion.

Table 1: Description of the objectives

| Objectives | Variables | Indicators | Sources of information | Methods of data collection | Tool for data collection |
|--|---|---|------------------------------------|--|--|
| Objective 1: To determine the knowledge and attitude influencing adoption of oral health and dental promotion by antenatal care providers in Moyo district. | <ol style="list-style-type: none"> 1. Knowledge of the antenatal care providers about oral health promotion for pregnant women. 2. Attitude of the antenatal care providers about oral health promotion for pregnant women. | <ul style="list-style-type: none"> • Knowledge on Oral Health promotion. • Attitude on Oral Health Promotion. | Health managers and ANC providers. | <p>Administration of Questionnaire.</p> <p>Interview.</p> <p>Focus Group Discussion.</p> | Semi-structured questionnaire for ANC providers (152 ANC providers), Key-Informant Interview guide for managers and . |
| Objective 2: To assess the available practices that influence adoption of oral health promotion by Antenatal care providers in Moyo district. | Practices related to health promotion by ANC providers. | <ul style="list-style-type: none"> • General Practices. • Emphasis on Nutrition. • Maintenance of Oral Hygiene. • Oral Health Assessment. | ANC providers | <p>Administration of Questionnaire.</p> <p>Focus Group Discussion.</p> | Semi-structured questionnaire for ANC providers |
| Objective 3: To determine the capacity of the health facilities to provide oral health promotion activities in antenatal care units in Moyo district. | Capacity of health facility to provide oral health promotion. | <ul style="list-style-type: none"> • Work Load. • Collaboration between Oral Health professionals and ANC providers. • Status of available dental services. • Level of staff motivation to perform desired strategy. • Involvement of peers of pregnant mothers. • Policy Guideline and Implementation. • Training on Oral Health Promotion. | Health managers and ANC providers. | <p>Administration of Questionnaire.</p> <p>Interview.</p> <p>Focus Group Discussion.</p> | <p>Semi-structured questionnaire for ANC'</p> <p>Key-Informant Interview guide-for managers and Providers and one FGD for ANC providers.</p> |

NB: 3 FGD for ANC providers, 7 Key Informants.

3.8 Selection of study subjects

3.8.1 Inclusion criteria

All Health workers who were working in ANC units, those who had ever worked at the facility and consented to the study.

All Midwives, Nurses, Clinical Officers and general medical doctors within the selected health facilities who consented to participate in the study.

3.8.2 Exclusion criteria

Health professionals who were not Nurses, Midwives, Clinical Officers, Gynaecologists, paediatricians, general medical doctors and who had never worked in ANC department prior to the study.

3.9 Data Collection and Study Instruments

3.9.1 Data collection

Self-administered questionnaires were used to collect information from respondents (ANC providers), who consented to participate in the study after clear explanation of the purpose of the study by the researcher.

Questions (see Appendix B) were designed in line with oral health promotion guidelines, including Newzealand Oral Health Guideline, State oral health Australia 2015-2020, WHO Strategies for oral disease prevention and health promotion, expert consultation on public health intervention against early Childhood caries, ANC guideline 2016 and other oral health promotion research works done in different parts of the world (Newzealand College of Midwives, 2008; (Western Australia Department of Health, 2016; WHO, 2017; Naseem *et al.*, 2016; American Academy of Pediatric Dentistry, 2016).

Focus Group discussion was used to get information from ANC providers who fulfilled the inclusion criteria.

Key-Informants interviews were done, these included; ADHO, Medical superintendent, Principle Nursing Officer, Health centre in-charges, Dental Surgeon and Public Health Dental Officer in charge of dental community Outreaches.

3.9.2 Study instruments

Self-administered questionnaires- Were used to obtain quantitative data from respondents.

Focus Group Discussion Guide- Five FGD were done each having a group of six to eight pregnant mothers, from three health facilities that fulfil the inclusion criteria, three FGD among ANC providers and seven Key informants participated, while taking notes of all the main points given by the members during the discussion and interview. 3 FGD among antenatal care provider points of saturation and redundancy were reached.

Key-Informants Interview guide: This was done, the key informants included; Assistant District Health Officer, Medical superintendent, Dentist, Principal Nursing Officer and Health centre in-charges, Public Health Dental Officer. 7 Key Informants interviews sufficiently led to the point of saturation and there was no need to have more interviews.

3.10 Data Analysis and Presentation Methods

3.10.1 Data Analysis

Quantitative data was analysed using Micro-soft Excel 2010 and SPSS 20. Chi-square statistics were computed to check for statistically significant differences in the parameters between the dependent and independent variables (Univariate, bivariate and multivariate analysis was performed in SPSS version 20.0).

Logistic regression was done to obtain strength of association between categorical dependent and independent variables and statistically significant items at this level where then analysed using stepwise multivariate logistic regression to obtain adjusted conclusion for the finding of the study.

Qualitative data was transcribed verbatim, coded and organised in themes in ATLAS.ti.

Triangulation was done to incorporate both the quantitative and qualitative data obtained from respondents.

3.10.2 Data Presentation Methods

Results of the analysed data were presented in form of tables, pie charts and graphs.

3.11 Quality Control

Pre-testing of questionnaires was done to ensure quality, validity and reliability, using data collection tools by the researcher in three (3) health facilities within Moyo district, and adjustments were made in reference to the responses obtained during the pre- testing process.

Trained six (6) Research Assistants who included qualified Nurse, midwife, double trained Nurse/midwife, one Public Health Dental Officer and Assistant health educator. Training was conducted to help them to know the aim of the research, create rapport with respondents, data

collection procedures, maintaining confidentiality, reassurance of respondents and ensure correctness of recorded data and consistency.

3.12 Ethical Considerations

Approval was sought from Uganda Martyrs University through the research supervisor.

An Introductory letter was obtained from Uganda Martyrs University (UMU) Faculty of Health Sciences and approval sought from the district health office Moyo district.

Written consent was obtained from the District Health Officer (DHO) through the Assistant District health officer in charge of maternal and child health and verbal consent from the Medical superintendent of Moyo hospital, in-charges of Dental unit, Antenatal care department and various health facilities under study and finally from participants under study.

The aim and method of carrying out the research was clearly explained and were assured of their safety.

Confidentiality of the respondents was assured; this included non-inclusion of names, and other health related issues concerning the respondent.

Respect for respondents was assured and there was clear indication of full autonomy by the respondents to participate in the research, including full respect for their personal views and that all data obtained were maintained anonymous and only used for the purpose for which is intended.

3.13 Limitations of the Study

Study could not be used to analyse behaviour or practices of the ANC providers over a period of time as it was snap shot.

Confounding bias- This was controlled by running stepwise multiple logistic regression analysis so as to arrive to meaningful and conclusive results.

3.14 Plans for Dissemination of Results

On completion of the study, findings shall be submitted to UMU management, a second copy to UMU Library. Other copies of the research report shall be submitted to Hospitals that participated in the study and to the Ministry of Health.

Presentations shall be made during semesters, including publishing of the report to peer reviewed journals.

CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter presents the findings of the study on the factors influencing adoption of oral and dental health promotion by Antenatal Care providers in Moyo district. The results are arranged according to practices (adoption), knowledge, attitude and capacity of health facilities to adopt oral and dental health promotion.

4.1.0 Demographic Characteristics of the respondents

A total of 152 ANC providers were included in the study. The mean age of respondents was 36 years and range of the age was 37 years, with a standard deviation of 10.49.

In terms of age category, 57(37.5%) of the respondents were 37 years and above followed by those aged 27-31 years 35(23.0%), those aged between 32-36 years 34(22.4%) and the least being those aged 22-26 years which accounted for 26(17.1%). And more than half 92(60.5%) of the respondents were females and 60(39.5%) were males.

Regarding the years in service, the majority 106(67.7%) of the respondents worked between 1-10 years followed by those between 11-20 years, those who had worked between 31-40 years accounted for 15(9.9%) and least 8(5.3%) being those who worked between 21-30 years.

Professional cadres interviewed were; midwives, nurses, nurses/midwives, clinical officers and medical officers. The majority of cadres interviewed were in the nursing profession 67(44.1%), 35(23.0%) for midwifery, those who doubled the profession as of trained Nurses and midwives accounted for 24(15.8%), 20(13.2%) were Clinical officers and least 6(3.9%) being medical

doctors. In terms of level of professional qualification, more than half 82(53.9%) of the respondents had certificate followed by Diploma 60 (39.5%) and bachelors 10(6.6%).

4.1.1 Adoption of Oral Health Promotion by ANC providers

In this study, a total of 152 ANC providers participated, with the majority 110/152 (72%) of them exhibiting practices that were not related to adoption of oral health promotion, while more than quarters 42 (28%) of them had individually adopted oral and dental health promotion for pregnant mothers.

Although the practices of the individual ANC providers appeared to fall below the expected level of good practice in the adoption of oral health practices, the management or officer in charge of the MCH programme felt that adoption or integration would be vital for overcoming some of the challenges of poor oral health as seen in the quotation;

“There is need to adopt or integrate oral health promotion in to ANC services so as to overcome some of the challenges created by poor oral health of the pregnant mothers”
(Assistant District Health Officer in charge of Maternal and Child Health, Moyo District, 24th /July/2017).

More emphasis supporting the need for adoption of Oral Health promotion by ANC providers also showed that adoption is likely to reduce heart diseases among pregnant mothers;

Of late there are increased cases of heart diseases..... originating from the dental issues as bacteria tend to move to the blood streams and later on move to the heart valves without knowing, adopting oral health promotion will have a possibility of reducing such challenges in the future (Medical Superintendent, Moyo General Hospital, 6th August 2017).

4.2.0 Knowledge and Attitude of the respondents on adoption of oral health promotion

4.2.1 Knowledge and adoption of oral health promotion by ANC providers

In terms of knowledge, only 23/152 (15.1%) of the ANC providers were highly knowledgeable about oral health promotion for pregnant mothers, while more than half 78/152 (51.3%) of the respondents were moderately knowledgeable and less than half 51/152(33.6%) had low knowledge.

A regression analysis to assess the strength of association between knowledge and adoption of oral health promotion showed that those with low knowledge were less likely to adopt oral health promotion compared to respondents who were highly knowledgeable (uOR 95%CI=0.36 (0.74 - 74.271).

In addition, respondents with moderate knowledge were two times more likely to adoption oral health promotion compared to those with high knowledge (uOR 95%CI=2.640 (0.889 – 7.835, p=0.000*). There was statistically significant relationship between knowledge and adoption of oral health promotion by ANC providers.

Table 2: Knowledge and adoption of oral health promotion by ANC providers

| Variables | Yes (%) | No (%) | Total | Chi-square (χ^2 (df) uOR (95%CI) | P-value |
|------------------|----------|----------|----------|---|---------------|
| Knowledge | | | | 18.788 | 0.000* |
| Low | 4(7.8) | 47(92.2) | 51(100) | 0.36(0.74-1.271) | |
| Moderate | 33(42.3) | 45(57.7) | 78 (100) | 2.640(0.889- 7.835) | |
| High | 5(21.7) | 18(78.3) | 23(100) | 1 | |

4.2.1.1 Demographic Characteristics and knowledge of respondents on adoption of OHP

In relation to age category of the ANC providers and knowledge on adoption of oral and dental health promotion, half 13/26 (50%) of the respondents aged 22-26 years were knowledgeable, with 11/26 (42.3%) moderately knowledgeable and 2/26(7.7%) were highly knowledgeable.

In addition, more than half 22/35(62.9%) of the ANC providers aged 27-31 years were knowledgeable, with 16/35(45.7%) of them moderately knowledgeable and 6/35(17.1%) highly knowledgeable.

It emerged that, nearly all respondents aged 37 years and above 47/57 (82.5%) were knowledgeable about adoption of oral health promotion, 38(66.7%) moderately knowledgeable and 9/57(15.8%) highly knowledgeable, implying that this age category was more knowledgeable compared to all other age categories and the least knowledgeable age category being 22-26 years. There was statistically significant association between age category and knowledge of respondents ($\chi^2=13.295$, $p=0.039^*$).

Gender of respondents were assessed and male 42/60(70.0%) were more knowledgeable compared to females of whom 59/92(64.1%) were knowledgeable.

In terms of number of years at work, respondents who worked for 11-20 years 18/23(78.3%) were more knowledgeable, followed by those who had worked between 21-30 years 6/8(75%). Respondents who have worked between 31-40 years 10/15(66.7%) were third knowledgeable and the least 67/106(63.2%) being those who had worked for 1-10 years and there was no statistically significant association between number of years at work and knowledge on adoption of oral health ($\chi^2=3.384$, $p=0.0759$).

In terms of professional cadre and knowledge on oral health promotion, medical officers were more knowledgeable 6 (100%), with half 3(50.0%) moderately knowledgeable and highly knowledgeable respectively. This was followed by Clinical Officers 18/20(90.0%) of whom were knowledgeable, with more than half 11/20 (55.0%) moderately knowledgeable and 7/20(35.0%) highly knowledgeable.

In addition, double trained Nurse/Midwives 16/24(66.7%) were the third knowledgeable in this study, 13/24(54.2%) moderately knowledgeable and 3/24(12.5%) highly knowledgeable.

However, more than half of the single trained Midwives 21/35(60.0%) were knowledgeable and the least knowledgeable professional cadre were single trained Nurses 39/67(58.2%) and there was statistically significant association between professional cadre and having knowledge on adoption of oral health promotion ($\chi^2=19.243$, $p=0.014^*$).

About levels of professional qualification, respondents who participated in this study were in three categories; Certificates, Diploma and Bachelor's Degree. Those who had Bachelors were more 9/10(90%) knowledgeable with only 1 (10%) not knowledgeable, followed by those with diplomas 47/60 (78.3) of 60 diploma holders and the least knowledgeable were those with certificates 45/82 (54.9%) certificate holders who participated in the study. There was statistically significant relationship between levels of professional qualification and knowledge on oral health promotion ($\chi^2=15.809$, $p=0.003^*$).

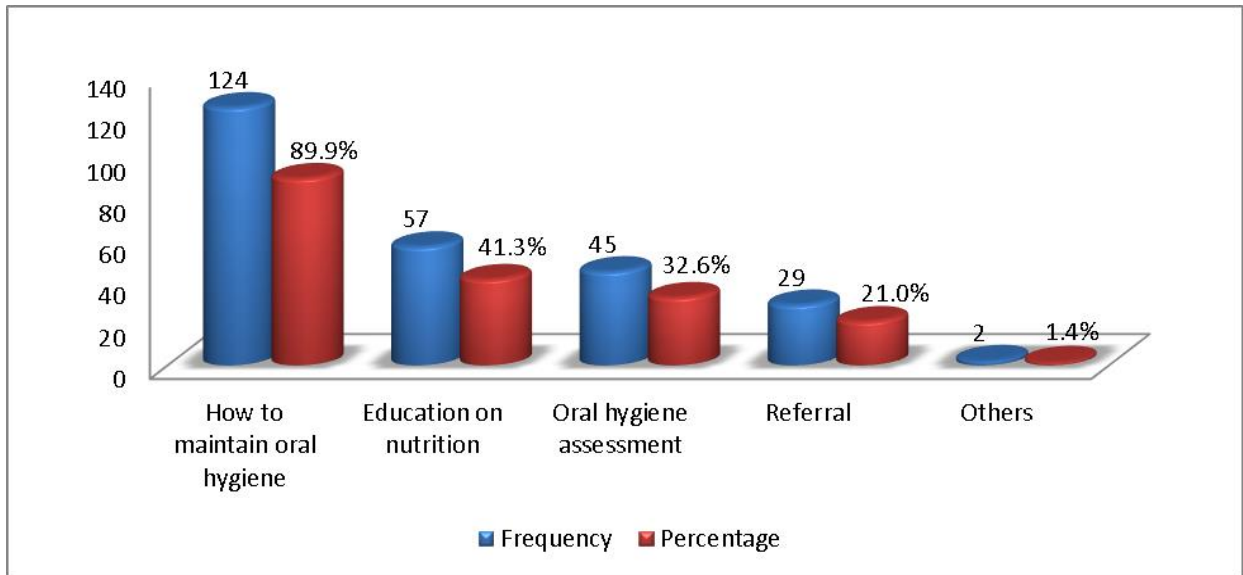
Table 3: Demographic characteristics and knowledge of respondents on adoption of Oral Health promotion

| Demographic Characteristics | Knowledge | | | Total | Chi-square (χ^2 df) | P-value |
|--|------------------|-----------------|-------------|--------------|--|----------------|
| Age Category (Years) | Low | Moderate | High | | (13.295)6 | 0.039* |
| 22-26 | 13(50.0%) | 11(42.3%) | 2(7.7%) | 26 | | |
| 27-31 | 13(37.1%) | 16(45.7%) | 6(17.1%) | 35 | | |
| 32-36 | 15(44.1%) | 13(38.2%) | 6(17.6%) | 34 | | |
| 37 and above | 10(17.5%) | 38(66.7%) | 9(15.9%) | 57 | | |
| Gender | | | | | (5.197)2 | 0.074 |
| Male | 18(30.0%) | 28(46.7%) | 14(23.3%) | 60 | | |
| Female | 33(35.9%) | 50(54.3%) | 9(9.8%) | 92 | | |
| Number of years at work | | | | | (3.384)6 | 0.0759 |
| 1-10 | 39(36.8%) | 52(49.1%) | 15(14.2%) | 106 | | |
| 11-20 | 5(21.7%) | 15(65.2%) | 3(13.0%) | 23 | | |
| 21-30 | 2(25.0%) | 4(50.0%) | 2(25.0%) | 8 | | |
| 31-40 | 5(33.3%) | 7(46.7%) | 3(20.0%) | 15 | | |
| Professional Cadre | | | | | (19.243)8 | 0.014* |
| Midwives | 13(37.1%) | 19(54.3%) | 3(8.6%) | 35 | | |
| Nurses | 28(41.8%) | 32(47.8%) | 7(10.4%) | 67 | | |
| Nurses/Midwives | 8(33.3%) | 13(54.2%) | 3(12.5%) | 24 | | |
| Clinical Officers | 2(10.0%) | 11(55.0%) | 7(3.5%) | 20 | | |
| Medical Officers | 0(0.0%) | 3(50.0%) | 3(50.0%) | 6 | | |
| Level of professional qualification | | | | | (15.809)4 | 0.003* |
| Certificate | 37(45.1%) | 38(46.3%) | 7(8.5%) | 82 | | |
| Diploma | 13(21.7%) | 35(58.3%) | 12(20.0%) | 60 | | |
| Bachelor's Degree | 1(10.0%) | 5(50.0%) | 4 (40.0%) | 10 | | |

4.2.1.2 Knowledge of the kind of preventive oral care pregnant women should receive

It emerged that the majority 124 (89.9%) of the respondents mentioned how to maintain oral hygiene, 57(41.3%) of the ANC providers mentioned education on nutrition, less than half 45(32.6%) and 29(21.0%) of the ANC providers mentioned oral health assessment as well as referral, only 2(1.4%) mentioned other preventive care services as the kind of preventive services pregnant women should receive.

Figure 1: Knowledge of the kind of preventive oral care pregnant women should receive



4.2.1.3 Multiple responses showing that these dental procedures are safe during pregnancy

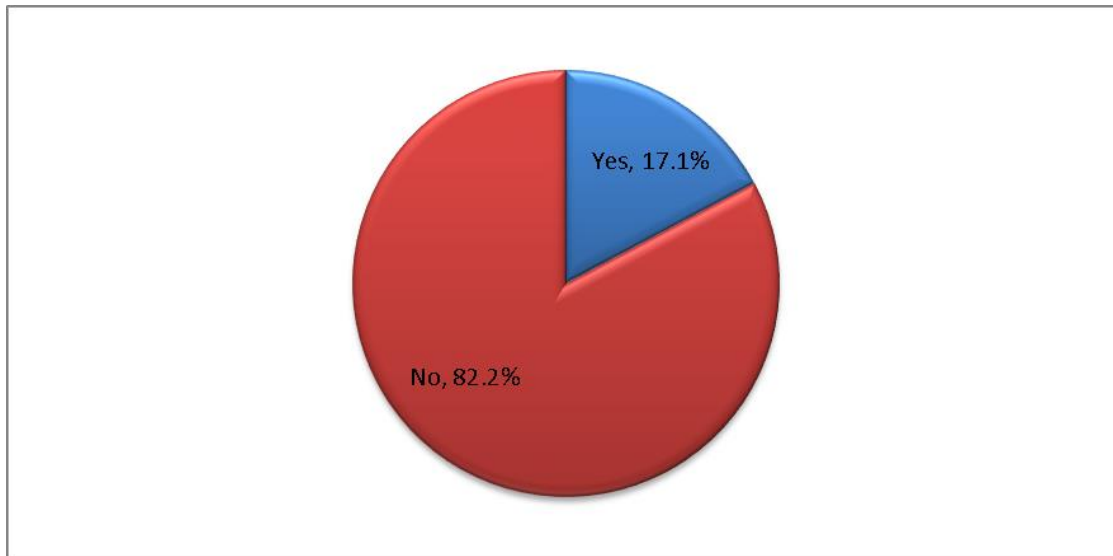
In this study, 55 (77.5%) of the ANC providers said that it is safe to use local aesthetic during pregnancy, followed by 45 (63.4%) who believed that teeth extraction is safe during pregnancy, 39 (54.9%) said scaling and Root planning is safe and less than half 34 (47.9%) of the respondents thought that Root Canal is safe in pregnancy.

There was misconception about the safety of dental services during pregnant among ANC providers, pregnant mothers and dentists;

4.2.1.4 It is safe to obtain dental radiographs in pregnant women

It emerged that, the majority 125 (82.2%) of the respondents were not aware that it is safe to obtain dental radiograph in pregnant women while only 26 (17.1%) of the respondents said obtaining dental radiograph in pregnant women is safe.

Figure 2: It is safe to obtain dental radiographs in pregnant women?



4.3 Attitude of respondents on adoption of oral health promotion

In this study, the majority 121 (81.8%) of the respondents had positive attitude towards adoption of oral health promotion in ANC services and only 27 (18.2%) had a negative attitude, having positive attitude contributes to 51.6% adoption of oral health promotion by ANC providers and there was no statistically significant association between having positive attitude and adoption of oral health promotion as shown in the table below (uOR 0.516 95%CI 0.181-1.467, p=0.215).

Table 4: Attitude of respondents on adoption of oral health promotion

| Variables | Adoption (%) | Non-Adoption (%) | Total | Chi-square (χ^2 (df) uOR (95%CI) | P-value |
|-----------------|--------------|------------------|----------|--|--------------|
| Attitude | | | | 1.580 | 0.209 |
| Positive | 37(30.6) | 84(69.4) | 121(100) | 0.516(0.181-1.467) | 0.215 |
| Negative | 5(18.5) | 22(81.5) | 27(100) | 1 | |

Pregnant mothers during focus group discussion also showed positive attitude towards adoption of oral health promotion, and said it would be comfortable their oral health being assessed by qualified medical personal.

“We are comfortable about our oral health being assessed by qualified health workers: we have friends who got miscarriage because they went to small private clinics and might have been given medicine that was not for them at such a time in pregnancy” (FGD- Moyo General Hospital, 26th July 2017).

In addition, ANC providers who participated in focus group discussion showed a positive attitude towards adoption of oral health promotion and said this would help reduce the misconception about oral health care and treatment among pregnant mothers.

“It is important to adopt Oral health promotion in to ANC, as what is learnt at this time is kept for life and it is mothers who are involved in teaching their children and also help reduce the misconception about oral health care and treatment among pregnant mothers”(FGD Among ANC Providers, Moyo Mission HC IV, 28th July 2017).

4.4.0 Health Facility factors influencing adoption Oral health promotion

4.4.1 Work load and Collaboration between oral health professionals and adoption of OHP

In terms of workload or whether it is easy to adopt oral and dental health promotion by ANC providers, the majority 109 (71.7%) said that it is easy to adopt oral health promotion due to the number of staff available, although less than half 30 (19.7%) of these were actually doing activities that were in line with adoption and more than half of those who said it is easy to adopt using available staff were not yet promoting oral health of pregnant mothers.

Only 43 (28.3%) of the respondents said adoption of OHP will not be easy, with 12(7.9%) already promoting oral health and 31(20.4%) not promoting oral health of pregnant women. There was no statistically significant relationship and those who said it is easy to adopt oral health promotion contributed to 1.9% adoption oral health promotion (uOR 1.019 95%CI 0.464-2.241, p=0.962).

“Human resource is enough to deal with the adoption of oral health promotion into ANC services.” (Public Health Dental Officer, Moyo General Hospital, 29th July 2017).

Nearly three quarters 93 (61.2%) of the ANC providers said there would be time to adopt oral health promotion and there was no statistically significant relationship between having time and adoption of oral health promotion, although having time contribute to 4.46% adoption of oral health promotion (uOR 1.0446 95%CI 0.703-2.941, p=0.317).

Less than half 34 (22.4%) of the respondents said items on ANC package were already too much, with 14(9.2%) who have already adopted, while the majority 118(77.6%) said items on ANC package are not too much. Items on ANC packages not being too much contribute to 3.8% adoption of oral health promotion by ANC providers and there was statistically significant relationship between respondents who said that items on ANC package were already too much and adoption of oral health promotion (uOR=0.380, 95%CI=0.156-0.923, P=0.033*).

In relation to collaboration among staff members, it emerged that the majority 99 (65.1%) of the respondents said good understanding exist between dental staff and ANC providers and analysis to show the strength of association indicated that respondents who had good understanding with dentists were three times more likely to adopt oral health promotion compared to those who did not have good understanding and there was statistically significant association between having good understanding between dentists and ANC providers and adoption of oral health promotion (uOR=3.083, 95%CI=1.105-8.603, P=0.031*).

The majority 132 (86.8%) of the respondents said that OHP requires interprofessional collaboration and there was no statistically significant relationship however, interprofessional collaboration contribute to 85.6% adoption of oral health promotion by ANC providers (uOR=0.856, 95%CI=0.290-2.523, P=0.778).

Table 5: Work load, collaboration between oral health professionals and adoption of oral promotion

| Variables | Adoption (%) | Non Adoption(%) | Chi-square (χ^2 (df) uOR (95%CI) | P-value |
|---|---------------------|------------------------|---|----------------|
| Work Load | | | | |
| Easy to adopt OHP due to the number of staff available | | | 0.002 | 0.962 |
| Yes | 30(19.7) | 79(52.0) | 1.019(0.464-2.241) | 0.962 |
| No | 12(7.9) | 31(20.4) | 1 | |
| There is time | | | 1.0008 | 0.315 |
| Yes | 23(15.1) | 70(46.1) | 1.0446 (0.703-2.941) | 0.317 |
| No | 19(12.5) | 40(26.3) | 1 | |
| Good understanding exists between dentists and ANC Providers | | | 10.826 | 0.001* |
| Yes | 36(23.7) | 63(41.4) | 3.083 (1.105- 8.603) | 0.031* |
| No | 6(3.9) | 47(30.9) | 1 | |
| OHP requires interprofessional collaboration | | | 0.080 | 0.778 |
| Yes | 37(24.3) | 95(62.5) | 0.856(0.290-2.523) | 0.778 |
| No | 5(3.3) | 15(9.9) | 1 | |

4.4.2 IEC, status of available dental services and adoption of OHP by ANC providers

In terms of availability of IEC materials in the health facilities, slightly more than half 90 (52.6%) of the respondents said they do not access we-sites that focus on oral health promotion for pregnant mothers, less than half 72 (47.4%) have the capacity to access web-sites.

There was no statistically significant relationship between accessing websites and adoption of oral and dental health promotion, however, accessing website contributed to 69.3% towards adoption of oral health promotion by ANC providers (uOR 0.693 95%CI 0.287-1.227, p=0.159).

More than half 80 (53.9%) of the ANC providers said that there was no practice guideline and there was no statistically significant relationship between having practice guideline and adoption of oral promotion. However, having practice guideline contributed to 48.2% towards adoption of oral health promotion by ANC providers (uOR 0.482 95%CI 0.229-1.013, p=0.054).

More than half 86(57%) of the respondents said that their facilities do not have posters for oral health and having posters contributed to 65.6% towards adoption of oral health promotion although there was no statistically significant relationship (uOR 0.656 95%CI 0.314-1.367, p=0.260).

“We have some few materials like flip charts on oral health education which could be used, although we need more materials including modals, fliers, brochures and so on both in English and the local language”(Principal Nursing Officer, Moyo General Hospital, 18th July 2017).

It also emerged that the majority 92 (60.5%) of the ANC providers said there was no attention given to oral health in the facilities and giving attention to oral health contributed to 80.2% adoption of oral health promotion (uOR 0.802 95%CI 0.384-1.677, p=0.558).

“Even if the staff members make recommendations for some dental items, the oral health department issues are always pushed aside and not taken care off” (Dental Surgeon, Moyo General Hospital, 12th August 2017).

According to the majority 104 (68.4%) of respondents, some oral health services were expensive, although there was no statistically significant relationship between whether oral health services were expensive and adoption of oral and dental health promotion and oral health services being less expensive contributed to 4.9% adoption of oral health promotion by ANC providers (uOR 0.49 95%CI 0.216-1.143, p=0.100).

About availability of oral/dental health services, more than half 95 (62.5%) of ANC providers said services were available while less than half 55 (36.2%) of the respondents said that most services were not available and it emerged that availability of oral health services within health facilities contributed to 43.9% on adoption of oral health promotion (uOR 1.439 95%CI 0.694-2.983, p=0.328).

It emerged during Focus group discussion and Key informants that most oral health services were not available at government health facilities;

The whole district only offers extraction within government health facilities, other services are in private dental clinic (Dental Surgeon, Moyo General Hospital, 12th August 2017).

In relation to whether some oral health conditions were referred outside the facilities, more than half 86 (56.6%) of the respondents said oral health services were not referred outside and not referring oral health conditions outside the facility contribute to 44.4% adoption of oral health promotion by ANC providers (uOR 1.444 95%CI 0.707-2.951, p=0.313).

Table 6: IEC, status of available dental services and adoption of oral promotion

| Variables | Adoption (%) | Non Adoption (%) | Chi-square (χ^2) uOR (95%CI) | P-value |
|--|---------------------|-------------------------|---|----------------|
| IEC Materials Available | | | | |
| I do not access web-sites that focuses on oral health promotion for pregnant mothers | | | 2.002 | 0.152 |
| Yes | 26(17.1) | 54(35.5) | 0.693(0.287-1.227) | 0.159 |
| No | 16(10.5) | 56(36.8) | 1 | |
| No practice guideline | | | 3.779 | 0.052 |
| Yes | 28(18.4) | 54(35.5) | 0.482(0.229-1.013) | 0.054 |
| No | 14(9.2) | 54(35.5) | 1 | |
| Facility do not have posters | | | 1.276 | 0.259 |
| Yes | 59(39.1) | 27(17.9) | 0.656(0.314-1.367) | 0.260 |
| No | 15(9.9) | 50(33.1) | 1 | |
| Status of available dental services | | | | |
| No attention given | | | 0.343 | 0.558 |
| Yes | 15(9.9) | 45(29.6) | 0.802(0.384-1.677) | 0.558 |
| No | 27(17.8) | 65(42.8) | 1 | |
| Most services are not available | | | 0.963 | 0.312 |
| Yes | 24(16.0) | 71(47.3) | 1.439(0.694-2.983) | 0.328 |
| No | 18(12.0) | 37(24.7) | 1 | |
| Some oral health services are expensive for the pregnant mothers | | | 2.767 | 0.096 |
| Yes | 33(21.7) | 71(46.7) | 0.49(0.216-1.143) | 0.100 |
| No | 9(5.9) | 39(25.7) | 1 | |
| Some Dental conditions referred outside this health facility | | | 1.022 | 0.312 |
| Yes | 21(13.8%) | 45(29.6%) | 1.444(0.707-2.951) | 0.313 |
| No | 21(13.8%) | 65(42.8%) | 1 | |

4.4.3 Level of Staff motivation and adoption of OHP by ANC providers

In relation to level of staff motivation, it emerged that 101 (66.4%) of the ANC providers had been supported to advance their career, no statistically significant relationship exist between being supported to advance ones career and adoption of oral health promotion. However, being supported to advance ones career contributed to 72.8% adoption of oral health promotion (uOR 0.728, 95%CI 0.335-1.581, p=0.423).

The majority 103(67.8%) of the ANC providers had not been given skills to promote oral health for pregnant mothers and being given skills contributed to 60.3% on adoption of oral health promotion (uOR 0.603 95%CI 0.288-1.266, p=0.181).

In addition, more than half 83 (54.6%) of the respondents who had always been hard and recognised had adopted oral health promotion for pregnant mothers, although there was no statistically significant relationship between being hard/recognised and adoption of oral health promotion. Being hard and recognised contributed to 72.6% on adoption of oral health promotion (uOR 0.726 95%CI 0.331-1.591, p=0.423).

Nearly three quarters 101 (66.4%) of the respondents said that management was good at influencing them to adopt new practices and there was statistically significant relationship between having good influence and adoption of oral health promotion. Interestingly, management being good at influencing staff to implementing new practices contributed to 3.0% on adoption of oral health promotion (uOR= 0.03, 95%CI=0.122- 0.735, P=0.008*).

The majority 121 (79.6%) of the respondents reported that they had a common understanding among themselves as staff members and that was their motivation, there was statistically significant relationship between having good understanding among staff members and adoption of oral health promotion. However, common understanding among staff members contributed to 56.7% on adoption of oral health promotion (uOR= 0.567, 95%CI=0.567-1.499, P=0.252).

“Matters of oral health and or dental diseases are not a priority even at the national level and this discourages lower cadres at district and sub-district levels. Dental staff members feel neglected and therefore priority should be attached to oral health issues in order to overcome the current oral health challenges eating up the people” (Dental Surgeon, Moyo General Hospital, 12th August 2017).

Table 7: Level of staff motivation and adoption of oral promotion by ANC Providers

| Variables | Adoption (%) | Non Adoption (%) | Chi-square (χ^2) uOR (95%CI) | P-value |
|---|---------------------|-------------------------|---|----------------|
| Staff Motivation | | | | |
| Have never been supported to advance my career | | | 0.646 | 0.422 |
| Yes | 30(19.7) | 71(46.7) | 0.728(0.335-1.581) | 0.423 |
| No | 12(7.9) | 39(25.7) | 1 | |
| Have been given skills to promote OH for pregnant mothers | | | 1.804 | 0.179 |
| Yes | 17(11.2) | 32(21.1) | 0.603(0.288-1.266) | 0.181 |
| No | 25(16.4) | 78(51.3) | 1 | |
| I have always been hard and recognized | | | 0.643 | 0.422 |
| Yes | 83(54.6) | 27(17.8) | 0.726(0.331-1.591) | 0.423 |
| No | 29(19.1) | 13(8.6) | 1 | |
| Management is good at influencing new practices | | | 7.422 | 0.006* |
| Yes | 35(23.0) | 66(43.4) | 0.03(0.122- 0.735) | 0.008* |
| No | 7(4.6) | 44(28.9) | 1 | |
| We have common understanding among the staff and that is our motivation | | | 1.334 | 0.248 |
| Yes | 36(23.7) | 85(55.9) | 0.567(0.567-1.499) | 0.252 |
| No | 6(3.9) | 25(16.4) | 1 | |

4.4.4 Involvement of pregnant Mothers and adoption of oral promotion by ANC providers

In relation to involving fellow pregnant mothers to promoting their own oral health, a good number 99(65.1%) of the ANC providers said it is necessary to involve pregnant mothers in promoting their own oral health and involving pregnant mothers contributed to 57.7% adoption of oral health promotion by ANC providers (uOR= 0.575, 95%CI=0.261-1.263, P=0.168).

The majority 134 (88.2%) of the respondents said health facilities have the capacity to train pregnant mothers to promote their own health. However, there was no statistically significant relationship between training pregnant mothers to promote their oral health and adoption of oral health. Training pregnant mothers to promote their own oral health contributed to 72.2% on adoption of oral health promotion (uOR= 0.722, 95%CI=0.223-2.333, P=0.586).

Table 8: Involvement of Mothers and adoption of oral promotion

| Variables | Adoption (%) | Non Adoption (%) | Chi-square (χ^2) uOR (95%CI) | P-value |
|--|--------------|------------------|--|---------|
| Involvement of pregnant mothers | | | | |
| Is it necessary to involve fellow pregnant mothers in promoting Oral Health? | | | 1.924 | 0.165 |
| Yes | 31(20.4) | 68(44.7) | 0.575(0.261-1.263) | 0.168 |
| No | 11(7.2) | 42(27.6) | 1 | |
| Does the health facility has capacity to train pregnant mothers to promote oral health | | | 0.299 | 0.585 |
| Yes | 38(25.0) | 96(63.2) | 0.722(0.223-2.333) | 0.586 |
| No | 4(2.6) | 14(9.2) | 1 | |

4.4.4.1 Multiple responses showing why peers of pregnant mothers should be involved

The reasons why pregnant mothers should be involved in promoting oral health were highlighted as follows; more than half 63(44.7%) mentioned that pregnant mothers act as role models, less than half 45 (31.9%) said they know their peers and 33 (23.4%) said, so that they own the program.

“We need to adopt Oral health promotion in ANC services so that pregnant mothers become advocates for promoting oral health to of their fellow pregnant mothers and the general community” FGD among ANC Providers (Besia HC III, 5th August 2017).

4.3.5 Policy guideline and implementation and adoption of oral promotion by ANC providers

About oral health policy and implement, the majority 144 (94.7%) of the respondents said that staff members should be involved in formulating policy and only 8(5.3%) said, it is not necessary to involve staff members in policy formulation. There was no statistically relationship between involvement of staff in policy formulation and adoption of oral health promotion by ANC providers ($\chi^2 = 3.224$, $p = 0.073$).

“We do not have oral health policies for ANC and there is no local guideline which is put in place yet. We do not have the National Oral Health policy even in our dental department and I have never seen it before” (Public Health Dental Officer, Moyo General Hospital, 29th July 2017).

The majority 146 (96.1%) of the respondents said there is need to develop oral health promotion guideline for pregnant mothers, only 6(3.9%) said is not needed. There was no statistically significant relationship between development of oral health promotion guideline for pregnant mothers and adoption of oral health promotion by ANC providers ($\chi^2 = 2.385$, $p = 0.123$).

Nearly all 150 (98.7%) the respondents said that there is need to develop National health policy that support oral health for pregnant mothers and only 2(1.3%) did not see for developing OH

policy that support oral health promotion for pregnant mothers. There was no statistically significant relationship between seeing the need to develop oral health policy that support oral health promotion for pregnant mothers and adoption oral health by ANC providers ($\chi^2 = 0.774$, $p = 0.379$).

“The biggest problem in is this country is having very good policies that are not put into practice, and due to poor motivation no one is willing to follow. The current oral health policy has been developed by some few individuals at the national level and those in the field are not aware” (Dental Surgen, Moyo General Hospital, 12th August 2017).

“There is no dissemination of the National Oral health policy, if oral and dental health issues are not marketed no one will pay attention and continues to be neglected, and yet adoption will lead to reduction on missed opportunities, maximizing resources – one staff offering all what is needed and improving serving delivery” (Assistant District Health Officer in charge of Maternal and Child Health, Moyo District, 24th July 2017).

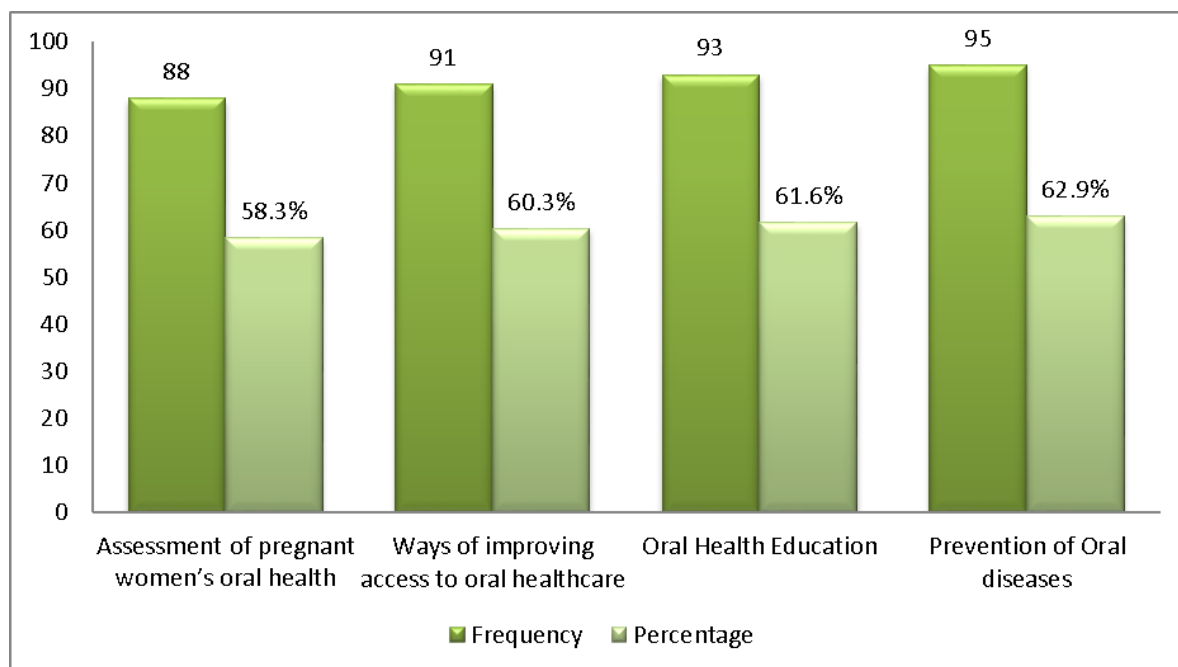
Table 9: Policy guideline and implementation and adoption of oral promotion

| Variables | Adoption (%) | Non Adoption (%) | Chi-square (χ^2) | P-value |
|--|--------------|------------------|-------------------------|--------------|
| Policy Guideline and implementation | | | | |
| It is necessary to involve staff members in formulating policy | | | 3.224 | 0.073 |
| Yes | 42(27.6) | 102(67.1) | | |
| No | 0(0.0) | 8(5.3) | | |
| Need to develop oral health promotion guideline for pregnant mothers | | | 2.385 | 0.123 |
| Yes | 42(27.6) | 104(68.4) | | |
| No | 0(0.0) | 6(3.9) | | |
| Need to develop oral health policy that support oral health for pregnant mothers | | | 0.774 | 0.379 |
| Yes | 42(27.6) | 108(71.1) | | |
| No | 0(0.0) | 2(1.3) | | |

4.4.5.1 Multiple responses on issues that should be included in oral health promotion guideline

The ANC providers were also asked to raise issues that should be included in the oral health promotion guideline. More than half 95 (62.5%) of the respondents mentioned almost all responses and these were; prevention of oral diseases and this was followed by oral health education 93 (61.2%), Oral health education 93 (61.6%), ways of improving access to oral healthcare 91(60.3%) and assessment of pregnant women’s oral health 88 (58.3%).

Figure 3: Multiple responses showing Issues to be Included in Oral Health Guideline



4.4.6 Training on Oral health promotion and adoption of oral promotion by ANC providers

In terms of training, the majority 100 (65.8%) of the respondents did not receive training on oral health, although 24 (15.8%) of those who had received training already adopted oral health promotion, there was no statistically significant relationship between being trained and adoption of oral health promotion.

However, being trained contributed to 59.6% on adoption of oral health promotion by ANC providers (uOR=0.596, 95% CI=0.287-1.241, P=0.167).

“It is necessary and possible to train ANC providers because some of them have some knowledge from their training institutions- we have already talked about training other cadres to help in dental and oral health issues. Training them on oral health education will not require much money and therefore it is possible to train them” (Public Health Dental Officer, Moyo General Hospital, 29th July 2017).

More than half 86 (56.6%) of the respondents had skills to advise pregnant mothers on oral health, while less than half 66 (34.4%) of the respondents had no skills, There was statistically significant relationship between having skills to advise pregnant mothers on oral health and adoption of oral health promotion by ANC providers ($\chi^2 = 5.209$, $p = 0.022^*$).

In addition, logistic regression analysis showed that respondents who had skills to advise pregnant mothers on oral health were two times more likely to adopt oral health promotion compared to those who did not have the skills. However, there was no statistically significant relationship between having skills and adoption of oral health promotion (uOR=2.012, 95% CI=0.822- 4.924, P=0.126).

The majority 147 (93.3%) of the respondents said it is important to design training package for OHP in ANC. No statistically significant relationship exist between designing training package for OHP and adoption of oral health by ANC providers ($\chi^2 = 1.583$, $p = 0.208$).

“With the increased population by the refugees, the available dental personals in the district are not enough therefore; training of the ANC providers will be necessary. We shall task the department of dental department with the department of health education to train ANC cadres. We would love all staff trained on general oral examination and health education so that all cadres take active part in oral health promotion” (Medical Superintendent, Moyo General Hospital, 6th August 2017).

It emerged that, the majority 147 (97.3%) of the respondents said training on basic oral health assessment will be helpful for ANC and only 4 (2.6%) of the respondents said it will not be helpful. However, no statistically significant relationship exist between saying training on basic oral health assessment would be helpful and adoption of oral health promotion by ANC providers ($\chi^2 = 1.583$, $p = 0.208$).

Table 10: Training on OHP and adoption of oral promotion by ANC providers

| Variables | Adoption (%) | Non Adoption (%) | Chi-square (χ^2) uOR (95%CI) | P-value |
|---|--------------|------------------|--|---------------|
| Training on OHP | | | | |
| I have received training on oral health in my field of study | | | 1.928 | 0.165 |
| Yes | 18(11.8) | 34(22.4) | 0.596(0.287-1.241) | 0.167 |
| No | 24(15.8) | 76(50.0) | 1 | |
| I have the skills to advise pregnant mothers on oral health | | | 5.209 | 0.022* |
| Yes | 30(19.7) | 56(36.8) | 2.012 (0.822- 4.924) | 0.126 |
| No | 12(7.9) | 54(35.5) | 1 | |
| It is important to design training package for OHP in ANC | | | 1.583 | 0.208 |
| Yes | 42(27.8) | 105(69.5) | | |
| No | 0(0.0) | 4(2.6) | | |
| Training on basic oral health assessment will be helpful for ANC | | | 1.583 | 0.208 |
| Yes | 42(27.8) | 105(69.5) | | |
| No | 0(0.0) | 4(2.6) | | |

4.4.7 Multivariate logistic regression of significant variables at bivariate level and adoption of oral health promotion

Multivariate stepwise results showed that good understanding between dentists and ANC providers contributed to 25.1% adoption of oral and dental health promotion and there was statistically significant association between having good understanding with dentists and adoption of oral health promotion by ANC providers (aOR=0.251, 95%CI=0.0093-0.677, P=0.006*).

In terms of knowledge, respondents who had moderate knowledge were three times more likely to adopt oral health promotion compared to those who had high knowledge on oral and dental health promotion and there was statistically significant relationship between knowledge and adoption of oral health promotion (aOR=3.205, 95%CI=1.050-9.785, P= 0.041*).

It also emerged that, management being good at influencing new practices contributed to 50.8% adoption of oral health promotion and there no statistically significant relationship (aOR=0.508, 95%CI=0.187-1.384, P=0.186).

Table 11: Multivariate logistic regression of significant results via stepwise at bivariate level and adoption of oral health promotion

| Variables | Adoption (%) | Non-Adoption (%) | aOR (95%CI) | P-value |
|---|--------------|------------------|---------------------|---------|
| Good understanding exists between dentists and ANC providers | | | | |
| Yes | 36(23.7) | 63(41.4) | 0.251(0.0093-0.677) | 0.006* |
| No | 6(3.9) | 47(30.9) | 1 | |
| Knowledge | | | | |
| Low | 4(7.8) | 47(92.2) | 0.432 (0.101-1.845) | 0.257 |
| Moderate | 33(42.3) | 45(57.7) | 3.205(1.050-9.785) | 0.041* |
| High | 5(21.7) | 18(78.3) | 1 | |
| Management good at influencing new practices | | | | |
| Yes | 35(23.0) | 66(43.4) | 0.508(0.187-1.384) | 0.186 |
| No | 7(4.6) | 44(28.9) | 1 | |

4.4.7 Summary of the Results

4.4.7.1 Adoption of Oral Health Promotion by Respondents

Although integration or adoption of oral health was generally perceived by ANC providers as good thing for mothers attending ANC, only 42/152 (28%) showed some positive signs of adoption.

4.4.7.2 Association between knowledge and adoption of oral health promotion by respondents

Knowledge and adoption of oral health promotion by ANC providers: It was observed that more than half 78 (51.3%) of the ANC providers were moderately knowledgeable and three times more likely to adoption oral health promotion compared to those who had high knowledge (aOR=3.205, 95%CI=1.050-9.785, P= 0.041*).

Demographic Characteristics and knowledge of respondents on adoption of OHP:

Respondents aged 37 years and above 47/57 (82.5%) were knowledgeable about adoption of oral health promotion, 38/57(66.7%) moderately knowledgeable and 9/57(15.8%) highly knowledgeable, implying that this age category was more knowledgeable compared to all other age categories. Male 42/60(70.0%) were knowledgeable compared to females of whom 59/92(64.1%) were knowledgeable. ANC providers who worked for 11-20 years 18/23(78.3%) were more knowledgeable. Medical doctors were more knowledgeable 6 (100%). Those with Bachelor's degree 9/10(90%) were more knowledgeable.

Knowledge on the safety of dental procedures during pregnancy: Generally, there was misconception about the safety of dental procedures during pregnancy, 55 (77.5%) of the respondents said that it is safe to use local aesthetic during pregnancy, 45 (63.4%) believed that teeth extraction is safe during pregnancy, 39 (54.9%) said scaling and Root planning is safe and less than half 34 (47.9%) of the respondents thought that Root Canal is safe in pregnancy and the majority 125 (82.2%) of the respondents were not aware that it is safe to obtain dental radiograph in pregnant women.

4.4.7.3 Association between attitude of respondents and adoption of oral health promotion

It emerged that the majority 121 (81.8%) of the respondents had positive attitude towards adoption of oral health promotion. Having positive attitude contributed to 51.6% adoption of oral health promotion and there was no statistically significant association between having positive attitude and adoption of oral health (uOR 0.516 95%CI 0.181-1.467, p=0.215).

4.4.7.4 Health Facility factors influencing adoption Oral health promotion

Work load and Collaboration between oral health professionals and adoption of OHP

Workload: The majority 109 (71.7%) of respondents said that it is easy to adopt oral health promotion due to the number of staff and saying it easy to adopt oral health promotion contributed to 1.9% on adoption oral health promotion (uOR 1.019 95%CI 0.464-2.241, p=0.962) and Management being good at influencing staff in implementing new practices contributed to 50.8% adoption oral health promotion (aOR=0.508, 95%CI=0.181-1.384, P=0.186).

Collaboration: Good understanding between dentists and ANC providers contributed to 25.1% on adoption of oral health promotion (aOR=0.251, 95%CI=0.0093-0677, P=0.006*).

IEC, status of available dental services and adoption of OHP by ANC providers

IEC Materials: Slightly more than half 90 (52.6%) of the respondents said they do not access we-sites and accessing website contributed to 69.3% on adoption of oral health promotion (uOR 0.693 95%CI 0.287-1.227, p=0.159). Practice guideline contributed to 48.2% on adoption of oral health promotion (uOR 0.482 95%CI 0.229-1.013, p=0.054) and health facilities having posters contribute to 65.6% adoption of oral health promotion (uOR 0.656 95%CI 0.314-1.367, p=0.260).

Status of the available dental services: Giving attention to oral health in the facilities contributed to 80.2% adoption of oral health promotion (uOR 0.802 95%CI 0.384-1.677, p=0.558), oral health services being less expensive contributed to 4.9% adoption of oral health promotion (uOR 0.49 95%CI 0.216-1.143, p=0.100), availability of oral health services within health facilities contributed 43.9% adoption of oral health promotion (uOR 1.439 95%CI 0.694-2.983, p=0.328). Not referring oral health conditions outside the facility contributed to 44.4% adoption of oral health promotion (uOR 1.444 95%CI 0.707-2.951, p=0.313).

Level of Staff motivation and adoption of OHP by ANC providers: It emerged that being supported to advance ones career contributed to 72.8% on adoption of oral health promotion (uOR 0.728, 95%CI 0.335-1.581, p=0.423), being given skills contributed to 60.3% adoption of oral health promotion (uOR 0.603 95%CI 0.288-1.266, p=0.181), being hard and recognised contributed to 64.3% on adoption of oral health promotion (uOR 0.726 95%CI 0.331-1.591, p=0.423). Management being good at influencing staff in implementing new practices contributed to 50.8% on adoption of oral health promotion (aOR= 0.508, 95%CI=0.187-1.384, P=0.186*).

Involvement of pregnant Mothers: Involving pregnant mothers contribute to promote their own health contributed to 57.7% adoption of oral health promotion (uOR= 0.575, 95%CI=0.261-1.263, P=0.168), health facilities having capacity to train pregnant mothers contributed to 72.2% adoption of oral health promotion (uOR= 0.722, 95%CI=0.223-2.333, P=0.586).

Policy guideline and implementation: The majority 144 (94.7%) of the respondents said that staff members should be involved in formulating policy, need to develop oral health promotion guideline for pregnant mothers 146 (96.1%) and nearly all 150 (98.7%) the respondents said that there is need to develop National oral health policy that support oral health for pregnant mothers.

Training on Oral health promotion: Being trained contributed to 59.6% adoption of oral health promotion (uOR=0.596, 95%CI=0.287-1.241, P=0.167) and ANC providers who had skills to advise pregnant mothers on oral health were two times more likely to adopt oral health promotion compared to those who did not have the skills (uOR=2.012, 95%CI=0.822- 4.924, P=0.126).

Qualitative results showed that there was some level of misconception about prenatal oral health care among Health managers, ANC providers and pregnant mothers. However, ANC providers including health managers and pregnant mothers were willing to stand out to advocate for adoption of Oral health promotion.

Both national and local negligence of oral health issues, limited continuous staff training on oral health, poor dissemination of National oral health policy and no local oral health care guideline for ANC providers were some of key issues that emerged from the qualitative results.

CHAPTER FIVE

DISCUSSION

5.0 Introduction

In this chapter, findings of the research were discussed in accordance with specific objectives. Responses were compared with similar studies reviewed in our literature.

5.1 Adoption of Oral Health Promotion by Respondents

A total of 152 ANC providers participated, the majority 110 (72%) of respondents were not doing practices related to adoption of oral health promotion while more than quarter 42 (28%) of them had individually adopted oral health promotion for pregnant mothers.

Antenatal care is an excellent means to achieving improved pregnancy outcome by promoting healthy behaviour and general preventive health care. Given several health challenges encountered by pregnant mothers, including association between oral diseases and poor pregnancy outcome, adoption or integration of oral health into ANC would be very crucial.

Adoption of oral health by ANC providers would play significant role not only in the lives of the pregnant mothers and also their babies and a study by Boggess *et al.*,(2011) showed that there was a relationship between maternal oral flora and child oral health, this implies that maternal behaviours, including attention to oral hygiene influences the risk of developing oral diseases during pregnancy and a possible effect on the baby., yet this could be reduced by education given to the pregnant mothers on general oral hygiene. Maternal oral health behaviour could be shaped during antenatal care.

A study conducted by Heilbrum-Lang *et al.*, (2015) among Nurses showed that promoting oral health among pregnant women would be feasible and need to be incorporated into the first antenatal booking visit and also recognized that oral health promotion was within their scope of practice.

5.1.1 Association between knowledge and adoption of oral health promotion by respondents

6.1.2 Knowledge and adoption of oral health promotion by ANC providers

It was observed that more than half 78 (51.3%) of the ANC providers were moderately knowledgeable and they were three times more likely to adopt oral health promotion compared to those who had high knowledge (aOR=3.205, 95%CI=1.050-9.785, P= 0.041*). This is in line with a study by Ajesh *et al.*, (2016) who indicated that ANC providers displayed adequate knowledge of the importance and safety of oral care in pregnancy.

In addition, a study conducted by Golkari *et al.*, (2013), also showed that health care workers were knowledgeable about periodontal disease and the association it has with adverse pregnancy outcome, implying that they could use the knowledge they had to educate pregnant mothers on the need for and how to practice proper oral hygiene and do regular dental check-up.

Similarly, a study by Patil (2013) showed that several physiological changes take place among pregnant women and these have effect on oral health, pregnancy and brings about several changes in the oral cavity.

5.1.3 Demographic Characteristics and knowledge of respondents on adoption of OHP

It emerged that, nearly all respondents aged 37 years and above 47/57 (982.5%) were knowledgeable about adoption oral health promotion, 38/57(66.7%) moderately knowledgeable and 9/57(15.8%) highly knowledgeable, implying that this age category was more knowledgeable compared to all other age categories and the least knowledgeable age category being 22-26 years. There was statistically significant association between age category and knowledge of respondents ($\chi^2=13.295$, $p=0.039^*$).

Medical officers were more knowledgeable 6 (100%) followed by Clinical Officers 18/20(90.0%). This was in line with a study conducted by Nagarakanti *et al.*, (2013) which showed that medical doctors were knowledgeable about the relationship between oral health and general health.

On the contrary, a study by Patil *et al.*, (2010) indicated that the majority of the medical practitioners were not knowledgeable about the fact that dental caries is infectious and could be transmitted from mother to child and they also had inadequate knowledge about the relationship between oral health and other parts of the body.

Double trained Nurse/Midwives 16/24(66.7%), more than half of the single trained Midwives 21/35(60.0%) and the least knowledgeable professional cadre were single trained Nurses 39/67(58.2%). This was in line with a study conducted by (Yazdani *et al.*, 2013) in Iran which indicated that, midwives had limited knowledge which affected their role in oral health education of pregnant mothers and therefore need to improve their knowledge.

In addition, a study conducted by Ajesh *et al.*, (2011) showed that midwives were generally unaware of the importance of maintaining oral health during pregnancy.

However, Ajesh *et al.*, (2016) stated that midwives with greatest improvement in knowledge had vital role in promoting maternal oral health and its effect on birth and baby, confidence in introducing oral health into antenatal care and referring women to dental services.

Those with Bachelor's degree 9/10(90%) were more knowledgeable, followed by those with diplomas 47/60 (78.3). Similarly, a study by Nagaranti *et al.*, (2013) among nurses showed that those who had undergraduates papers had adequate knowledge on the basic oral structure and identifying oral diseases, however, few of them were able to help patients with tooth brushing, visits to dentists.

In addition, a study conducted by Budhathoki *et al.* , (2017) showed that that barriers for healthcare engagement included knowledge and education level implying a strong need to provide oral Health literacy for ANC providers so that they are able to access and use oral health information for pregnant mothers.

5.1.4 Knowledge on the safety of dental procedures safe during pregnancy

It appears that there is misconception among the ANC providers about the safety of different dental services that pregnant women should receive. 55 (77.5%) of the ANC providers it is said safe to use local aesthetic during pregnancy is safe, 45 (63.4%) believed that teeth extraction is safe during pregnancy, 39 (54.9%) said scaling and Root planning is safe and less than half 34 (47.9%) of the respondents thought that Root Canal is safe in pregnancy.

This kind of misconception about the safety of dental procedures should be addressed in order to improve service utilization and oral health promotion among pregnant mothers.

Wrzosek and Einarson (2009), use of local anesthetics, amalgams, x-ray scan, plaque removal, dental scaling and polishing and tooth extractions during pregnancy have no adverse pregnancy outcome. However, Hashim and Akbar (2014) also found that there was misconception among gynecologists about the safety of some of the dental procedures for pregnant mothers.

Ping *et al.*, (2015) agreed with the fact that local anesthetics are safe although with some negligible adverse effect, these effects according to Batinac *et al.*, (2013) may include immune response-mediated allergic reactions and others that are unrelated to the immune response and these allergic responses are very rare in practice.

About the safety of obtaining dental radiographs in pregnant women, the majority 125 (82.2%) of the ANC providers were not aware that it is safe to obtain dental radiograph in pregnant women and Rainchuso (2013) revealed that use of dental radiographs for pregnant women do not pose any risk to the developing fetus, however it is recommended to use protective lead aprons and thyroid collar to shield the sensitive areas.

This kind of misconception could however be overcome among ANC providers by continuous in services professional training and collaboration among different professionals within the different health facilities.

5.1.5 Association between attitude of respondents and adoption of oral health promotion

It emerged that the majority 121 (81.8%) of the respondents had positive attitude towards adoption of oral health promotion. Having positive attitude contributed to 51.6% on adoption of oral health promotion and there was no statistically significant association between having positive attitude and adoption of oral health (uOR 0.516 95%CI 0.181-1.467, p=0.215).

This finding is not in line with a study by Rabiei *et al.*, (2014) who indicated that despite the fact that some nurses believed in their essential role in preventing oral diseases, only half of them had positive attitude that their OHC would be effective.

And according to Bahramian *et al.*, (2018) barriers to dental utilization among pregnant women included misconceptions, fear and lack of willingness among health workers to accept treatment for pregnant women. Rogers (2003) stated that the higher the belief or capacity of an individual to execute actions to achieving health goals, the higher motivation for personal change.

Fulmer and Cabreta (2012) found that less than half of ANC providers were interested of incorporating oral health care into their routine patient visits, perhaps because of their hectic daily workload or may be because they may think that oral health is outside their scope of practice

On the contrary, Wanderal *et al.*, (2012) found that most pregnant women had poor oral health practices and misconceptions in prevention of oral health diseases as they are more concerned about general health, less aware and concerned about dental health, yet they are more predisposed to oral health diseases compared to the general population.

5.3.0 Health Facility factors influencing adoption Oral health promotion

5.3.1 Work load and Collaboration between oral health professionals and adoption of OHP

Workload and collaboration between oral health professionals and ANC providers was generally significant. The majority 109 (71.7%) of respondents said that it is easy to adopt oral health promotion due to the number of staff saying it easy to adopt oral health promotion contribute to 1.9% adoption oral health promotion (uOR 1.019 95%CI 0.464-2.241, p=0.962).

This is supported by the Annual Health sector performance report 2014/2015 which indicated that in the general dental department, Dentists, Dental assistants and public health dental officers available at government facilities were limited, only 13% (MoH, 2015).

Oral health professionals alone may not manage to promote oral health for vulnerable groups that include pregnant mothers with whom they have limited access to interact, however adoption would be easy if ANC providers are involved.

It appears that time is not a barrier to adoption of oral health promotion by ANC providers as the majority 93 (61.2%) of them said there would be time to adopt oral health promotion, although a study conducted by Skeie *et al.*, (2011) among nurses noted that one of the key challenges to promoting oral health information was lack of time.

ANC package should have already officially included all what is required to promote oral health, actually some of the items about nutrition; smoking and many others are part of oral health promotion. ANC packages not being too much contributed to 15.6% on adopt oral health promotion by ANC providers (uOR=0.380, 95%CI=0.156-0.923, P=0.033*)

Rogers (2011) showed that integration of oral health promotion is an important aspect of ANC and efficient than targeting a single disease or condition and also solving challenges of time as one deals with prevention of several diseases within one visit.

In addition, having good understanding between dentists and ANC providers contributed to 25.1% on adoption of oral health promotion and there was statistically significant association between having good understanding between dentists and adoption of oral health promotion (aOR=0.251, 95%CI=0.0093-0677, P=0.006*). A study by George *et al.*, (2012), who found that there was no common understanding between dentists and prenatal care providers in respect to oral health care during pregnancy and this may be a challenge in achieving adoption of oral health promotion.

Generally, having management that is good at influencing staff in implementing new practices contributed to 50.8% on adoption oral health promotion, however there was no statistically significant relation between management being good and influencing staff and adoption of oral health promotion (aOR=0.508, 95%CI=0.181-1.384, P= 0.186). Kelly *et al.*, (2017) showed that good climate for staff in an organization is strong predictor for adoption of new practices.

The majority 132 (86.8%) said OHP requires interprofessional collaboration. According to Maree *et al.*, (2015) inter-professional collaboration education model for dental and medical providers is needed and provision of appropriate referral system for comprehensive clinical care of pregnant patients and accredited standards that encourage development and implementation.

In addition, due to the possible association between maternal and infant oral health and between periodontal infection and general health, antenatal care providers should collaborate with dentists to encourage all pregnant women to comply with the oral health professionals' recommendations regarding appropriate dental brushing techniques and the importance of dental visits (Villa *et al.*, 2013).

However, according to McDonald *et al.*, (2012) Collaboration across organizational boundaries remains challenging due to power dynamics and trust that affect the strategic choices made by each health professional about whether to collaborate, with whom, and to what level. These decisions directly inter-professional relationships trust and respect can be fostered through a mix of interventions aimed at building personal relationships and establishing agreed rules that govern collaborative care and that are perceived as fair to all professions.

5.3.2 IEC, status of available dental services and adoption of OHP by ANC providers

In terms of availability of IEC materials in the health facilities, slightly more than half 90 (52.6%) of the respondents said they do not access we-sites and accessing website contribute to 69.3% adoption of oral health promotion by ANC providers (uOR 0.693 95%CI 0.287-1.227, p=0.159).

However a study by Quinonez and Boggess (2013) showed that oral health promotion program should consist of training materials, including videos on oral health education for non-dental health care providers and pregnant women, and access to a prenatal-focused oral health education websites.

More than half 86(57%) of the respondents said that their facilities do not have posters for oral health and health facilities having posters contribute to 65.6% adoption of oral health promotion (uOR 0.656 95%CI 0.314-1.367, p=0.260).

Similarly a study by Kolisa, (2016) showed that some of the work related challenges among Nurses to providing oral health education for pregnant mothers included shortage of IEC materials.

The majority said oral health services expensive, Oral health services being less expensive contribute to 4.9% adoption of oral health promotion by ANC providers (uOR 0.49 95%CI 0.216-1.143, p=0.100).

Accordingly, the majority 104 (68.4%) of respondents said that some oral health services were expensive. This is similar to a study by Ajesh *et al.*, (2011) that showed, in most cases the cost of dental services were believed to be high and this is a common challenge preventing pregnant mothers from consulting oral health professionals, especially those women who are from low-income families.

In addition, Sanchez *et al.*, (2017) also found that one of the main barriers preventing patients from seeking oral health care among others included high cost of dental services.

5.3.3 Level of Staff motivation and adoption of OHP by ANC providers

In relation to level of staff motivation, it emerged 101 (66.4%) of the respondents had been supported to advance their career. Being supported to advance ones career contributed to 72.8% on adoption of oral health promotion (uOR 0.728, 95%CI 0.335-1.581, p=0.423).

The majority 103(67.8%) of the respondents had not been given skills to promote oral health for pregnant mothers. Similarly a study by Peters *et al.*, (2010) found that the common areas of health worker motivation that should be considered by managers and policy makers are non-financial motivators such as skill development opportunities.

Burke and Litwin, (1992) further explained that when staff members have skills, ability and or knowledge needed to perform needed activities and are motivated by matching well their jobs,

the skills they have would be put to appropriate use. Implying that having skills play very important role in adopting a needed practice of oral health promotion.

In addition, the majority 83 (54.6%) of the respondents who have always been hard and recognised had adopted oral health oral health promotion, being hard and recognised contributed to 64.3% adoption of oral health promotion (uOR 0.726 95%CI 0.331-1.591, p=0.423).

Similarly, a study conducted by Okello and Gilson (2015) revealed that work place trust interaction and cooperation among health care workers have a direct link to intrinsic motivation, and the more staff members are motivated among each other the more they are willing to adopt new innovations that continues to help them work together.

Interestingly, respondents 101 (66.4%) who said management was good at influencing staff in implementing new practices were less likely to adopt oral health promotion compared to those who said management was not good (uOR= 0.03, 95%CI=0.122- 0.735, P=0.008*).

On the contrary, a study by Topp and Chipukuma (2015) showed that poor leadership were key factors leading to providers' weak workplace trust and contributed to often-poor quality services, driving a perverse cycle of negative patient-provider relations.

The majority 121 (79.6%) of the respondents reported that they had a common understanding among themselves as staff members and that was their motivation ($\chi^2 = 1.334$, p= 0.248).

According to a study conducted by (Ayamolowo *et al.*, 2013) a healthy work environment for nurses in the primary health care settings is an important factor in improving work satisfaction, reducing turnover intention and improving nursing care outcomes.

5.3.4 Involvement of pregnant Mothers and adoption of oral promotion by ANC providers

In relation to involving fellow pregnant mothers to promoting their own oral health, 99(65.1%) of the respondents said it is necessary to involve pregnant mothers and this contributed to 57.7% adoption of oral health promotion by ANC providers (uOR= 0.575, 95%CI=0.261-1.263, P=0.168) . Similarly, it was noted by McLeis and Redshow (2017) that one on one peer support during and after pregnancy posed a positive impact on mothers' emotional wellbeing and encouraged each other to promise and value a particular intervention at hand for their wellbeing.

The majority 134 (88.2%) of the ANC providers said, health facilities have the capacity to train pregnant mothers to promote their own health and this contributed to 72.2% adoption of oral health promotion (uOR= 0.722, 95%CI=0.223-2.333, P=0.586).

It was clearly highlighted in Ottawa charter that in order to achieve equity in health, focus should be put on creating supportive environment, people should be able access information and people may not achieve their fullest health potential unless they are able to take control of those things which determine their health and training pregnant mothers on oral health promotion would be in line with the Charter, helping people take charge of their lives.

A study carried out by Ingram (2013) who found that introduction of targeted peer support is a very important aspect of psychosocial support for mothers and health professionals and continued support during antenatal and postnatal care services are very crucial.

Involvement of pregnant mothers would also be a sign of strengthening community actions in adopting oral health promotion and help facilitate self-help and social support and develop flexible systems for strengthening public participation as indicated in Ottawa Charter.

5.3.5 Policy guideline and implementation and adoption of oral promotion by ANC providers

About oral health policy and implementation, the majority 144 (94.7%) of the respondents said that staff members should be involved in formulating policy ($p= 0.073$). Similarly according Shariff (2014), Nurses should be involved in health policy development and some of the key participatory roles in health policy development include mentoring, supporting and developing future nurse policy makers.

In addition, WHO (1986) during Ottawa charter also emphasized that all sectors at all levels be involved in formulating policy and direct them to be aware of the health consequences of their decisions and to accept their responsibilities for health, health promotion policy requires the identification of obstacles to the adoption of healthy public policies and ways of removing them, thus health policies must focus on making it easy for beneficiaries to make healthier choices.

Involvement of staff members would help them own what is in the policy and also improve on policy dissemination and implementation at all levels, avoiding situations where in a district some oral health professionals have not even seen the national oral health policy until it was presented to them during the research work.

The majority 146 (96.1%) of the respondents said there is need to develop oral health promotion guideline for pregnant mothers ($p=0.123$), although this was not statistically significant, many countries have developed oral health guideline for pregnant mothers to help them improve the oral health of both pregnant mothers and the babies and according to Ajesh *et al.*, (2016), the main barriers for ANC providers in promoting oral health was lack of practice guidelines on oral health care during pregnancy and therefore there is need to involvement of health care providers

in making policies that are geared towards bridging the gap in prenatal oral health promotion that are regularly reviewed for effectiveness and efficiency.

Nearly all 150 (98.7%) the respondents said that there is need to develop National health policy that support oral health for pregnant mothers ($\chi^2 = 0.774$, $p = 0.379$). the current national oral health policy has no clear provision for prenatal oral health care. Similarly, Wandera *et al.*, (2012) also noted that there is need for local and national health policy agenda in Uganda to incorporate prevention of oral diseases during pregnancy.

Burke-Litwin model denotes that, when staff members feel that organizational policies and procedures are favourable to them, they are motivated to perform the required actions, implying that appropriate formulation and implementation policies motivate staff members perform required actions.

In addition to the above, a study by Harnagea *et al.*, (2017) showed that some of the factors that facilitate integration of oral health were supportive policies including interdisciplinary education, collaborative practices between dental and other healthcare professionals.

On the contrary, a study by Riggs *et al.*, (2016) showed that policy-to-practice gap is significant and if not addressed has the potential to widen oral health inequalities across the different groups of people.

5.3.6 Training on Oral health promotion and adoption of oral promotion by ANC providers

In terms of training, 100 (65.8%) of the respondents did not receive training on oral health, although 24 (15.8%) of them had adopted oral health promotion and being trained contributed to 59.6% adoption of oral health promotion by ANC providers (uOR=0.596, 95%CI=0.287-1.241, P=0.167).

This is contrary to a study conducted by Curties *et al.*, (2013) which showed that, the majority of the health institutions reported teaching prenatal oral health to their students although clinical exposure was limited.

Also according Pesarsessi *et al.*, (2014) nurses considered oral health very important and were willing to participate actively in oral health programs provided that they receive training.

More than half 86 (56.6%) of the ANC providers who had skills to advise pregnant mothers on oral health were two times more likely to adopt oral health promotion compared to those who did not have the skills. However, there was no statistically significant relationship between having skills and adoption of oral health promotion (uOR=2.012, 95%CI=0.822- 4.924, P=0.126).

Momanyi *et al.*, (2016) revealed that due to the skills attained, health workers were able to perform desired tasks, more regular training and paying attention to discuss career development prospects would be of great value to advance their skills.

The majority 147 (93.3%) of the respondents said it is important to design training package for OHP in ANC (p= 0.208). Similarly Patil *et al.*, (2013) indicated that dentists and gynaecologists showed that dental management during pregnancy still presents some deviations from scientific literature recommendations, indicating the need to establish training guidelines for prenatal dental care.

It emerged that, the majority 147 (97.3%) of the respondents said training on basic oral health assessment will be helpful for ANC. This is in line with a study Wooten *et al.*, (2016) who noted that Nurses and Midwives frequently meet and examined pregnant mothers and this put them at a better position to carry out oral health screening for this group, coupled with the fact that there is limited number of dentists and public health dental officers who rarely interface with the pregnant mothers.

Furthermore, Tetuan (2004) said that Nurses have great potential for incorporation of oral health assessment and screening in their practice so long as they are given the required knowledge and skills to assess oral health.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter consists of the findings of the summary categorised into conclusion and recommendations derived from results of the study.

6.1 Conclusions

Adoption of Oral health promotion by antenatal care providers was low at 42/152 (28%).

Some of key that factors that would improve the level of adoption of oral health promotion by antenatal care providers included; Being Knowledgeable and it emerged that those moderately knowledgeable were three times more likely to adopt oral health promotion ($p= 0.041^*$), having good understanding between dentists and antenatal care providers and good understanding between dentists and ANC providers contributed to 25.1% on adoption of oral health promotion ($p=0.006^*$) and management being good at influencing staff in implementing new practices contributed to 50.8% adoption oral health promotion ($p= 0.186$).

However, some of the reasons for decreased level of adoption included; having misconception about oral health care for pregnant mothers, inadequate knowledge about oral health promotion, poor dissemination of National oral health policy and implementation of the oral health policy and lack of prenatal oral health guideline.

6.2 Recommendations

The following recommendations were drawn from the study

- i. The Ministry of Health needs to design oral health promotion training package for all ANC providers in order to enhance their knowledge and skills for effective adoption of oral health promotion and reorient activities in ANC services that should intentionally include OHP activities.
- ii. The ministry of Health together with district and sub-district authorities, including health promotion specialists, dentists and ANC providers to develop guidelines for oral health promotion and initiate good understanding and collaboration between dentists and other health care professionals.
- iii. Both at ministry, district and sub-district levels there should be practical commitment and interest taken and resources provided in order to implement what is in the policy.
- iv. Ministry and partners need to develop clear training curriculum for all medical health students on oral health promotion for pregnant mothers.
- v. Ministry of health need review the current National Oral health policy and its implementation should use both bottom-top and top-bottom approaches, involving all cadres and clearly indicating how to promote oral health of pregnant mothers.
- vi. Districts and sub-districts should emphasize the need for internal continuous professional training of both ANC providers and dental professionals.
- vii. Clear inclusion of oral health care for pregnant mothers in Uganda Clinical guide that would be accessible to all health care professionals by the Ministry of Health.

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Appendix A
Consent Form

Introduction

My name is Lulu Patrick Madrama, a Student of Uganda Martyrs University, Faculty of Health Sciences; I am carrying out a research as part of requirement for the award of Master of Public Health-Health Promotion.

The goal of this research is to contribute to the improvement of general health status of mothers and their children through integration of oral health promotion to ANC services.

This interview will take between 15 to 25 minutes in a confidential setting.

Confidentiality; information about you will not be revealed to anyone and the information got will only be used for the purpose of the study, only individuals involved in the data collection will have access to the data collected with no personal names indicated.

Right to withdrawal; it is by choice to participate in this study and you may decide to withdraw from the study whenever you wish and no penalty will be put on you for refusal to continue in the study.

Benefits: Your participation in this study will provide very important information that would help to establish the factors influencing adoption of oral health promotion by Antenatal care providers in Moyo district. Findings from here could also be communicated to policy makers and other stakeholders hence may help improve the situation on the ground

Sign: _____ Date: ____/____/____

Participant

Appendix B
A Questionnaire

A Questionnaire to collect data on factors influencing adoption of oral health promotion by Antenatal Care providers within Moyo district.

Information about the health facility

Name of the health facility _____

Sub county _____

Level of care (a) Hospital (b) HC IV (c) HC III

Ownership (a) Government (b) Private-Non for profit (b) Private for profit

Section A: Socio-Demographic Data

Please choose the right alternative

| | | | |
|----|-------------------------------------|---|--|
| 01 | Age (Years) | | |
| 02 | Gender | (a) Male | (b) Female |
| 03 | Number of years at work | (a) 1-10 years (b) 11-20 years | (c) 21- 30 years (d) 31- 40 years |
| 04 | Professional Cadre | (a) Midwife (b) Nurse (c) Clinical Officer (d) Gynaecologist | (d) General medical doctor (e) Paediatrician (g) Others (Specify) ----- |
| 05 | Level of professional qualification | (a) Certificate (b) Diploma | (c) Bachelor's Degree (d) Master's Degree (e) Others (Specify) ----- |

Section B: Knowledge (15 items) and attitude (6 items) that influence adoption of oral health promotion

Please circle the response that you think are appropriate to the suggested knowledge item

| Knowledge Regarding Oral Health | | | |
|--|--|--|---|
| 06 | Dental diseases among pregnant mothers have effect on the pregnancy | (a) Yes | (b) No |
| 07 | Physiological changes during pregnancy predisposing mothers to gum diseases. | (a) Yes | (b) No |
| 08 | Pregnancy accelerates existing dental problem? | (a) Yes | (b) No |
| 09 | Poor maternal oral health can contribute to early Childhood teeth decay | (a) Yes | (b) No |
| 10 | Women should receive preventive dental care during pregnancy? | (a) Yes | (b) No |
| | If yes in (10) above, name type of preventive care women should receive during pregnancy. | (a) How to maintain oral hygiene. (b) Education on Nutrition. | (d) Oral health assessment (e) Referral (f) Others (Specify) ----- |
| 11 | Is it safe to obtain dental radiographs in pregnant women? | (a) Yes | (b) No |
| 12 | Should Pregnant women only receive emergency Dental care? | (a) Yes | (b) No |
| 13 | If no to (12) above, are these dental procedures safe during pregnancy? (i) Extractions (ii) Local anaesthetic (iii) Root canal (iv) Scaling and root planning | (a) Yes (a) Yes (a) Yes (a) Yes | (b) No (b) No (b) No (b) No |

| | | | |
|----|--|---------|--------|
| 14 | Periodontal diseases is common among pregnant women | (a) Yes | (b) No |
| 15 | I am concerned about being sued if something goes wrong in a pregnancy | (a) Yes | (b) No |
| 16 | Would it be easy to understand and adopt oral health promotion during ANC services? | (a) Yes | (b) No |
| 17 | Adoption of oral health promotion in ANC services will meet the oral health need of pregnant mothers? | (a) Yes | (b) No |
| | Attitude towards adoption Oral Health promotion by ANC Providers | | |
| 18 | Is it necessary to adopt oral health promotion in ANC services? | (a) Yes | (b) No |
| 19 | Are you interested of participating in promoting oral health for pregnant mothers? | (a) Yes | (b) No |
| 20 | Asking pregnant women about oral health is outside routine ANC practice. | (a) Yes | (b) No |
| 21 | Pregnant women will be comfortable with assessing oral health during normal antenatal check-ups. | (a) Yes | (b) No |
| 22 | Will you stand out to advocate for adoption of oral health promotion in ANC services? | (a) Yes | (b) No |
| 23 | I first want to see the results of adopting oral health promotion in ANC services before I take part in it | (a) Yes | (b) No |

Section C: Practices of oral health promotion by ANC providers (measurement of adoption of oral health promotion was done using these 24 items)

Tick where appropriate

| | Practices of ANC Providers | Always | Someti mes | Never |
|----|--|--|---|--------------|
| 24 | I discuss the importance of oral health with pregnant women during clinical care. | | | |
| 25 | I ask specific questions related to oral health practices. | | | |
| 26 | I provide counselling regarding dental caries prevention. | | | |
| 27 | I teach pregnant mothers about how to do mouth rinsing | | | |
| 28 | I teach pregnant mothers on proper tooth brushing | | | |
| 29 | I provide counselling regarding the association of poor periodontal health with negative birth outcomes | | | |
| 30 | I advise pregnant women to visit dentists during early pregnancy | | | |
| 31 | I provide information on the need for limiting sweet foods and drinks | | | |
| | Emphasis on Nutrition | | | |
| 32 | The key issues that I advise pregnant mothers on Nutrition include. (i) Foods and drinks that reduce once changes of developing oral diseases. (ii) The need for the food supplements like Calcium and vitamins (iii) Maintaining healthy body weight. (iv) Tobacco use and Alcohol consumption (v) Others (Specify)..... | (a) Yes (a) Yes (a) Yes (a) Yes | (b) No (b)No (b) No (b) No | |
| | Maintaining Oral Hygiene | | | |
| 33 | I educate pregnant mothers about oral hygiene | (a) Yes | No | |
| 34 | Because of Nausea and vomiting I advise pregnant mothers to:- (i) Chew sugarless gum after meals. (ii) Rinse their mouth with a teaspoonful baking soda in a cup of | (a) Yes (a) Yes | (b)No (b)No | |

| | | | |
|-------------------------------|---|-------------------------------|-------------------------|
| | water after vomiting to neutralize acid. (iii) Brush their teeth twice a day using fluoride toothpaste. (iv) Others (Specify) | (a) Yes | (b)No |
| 35 | I advise mothers to stop sharing saliva and spoon | (a) Yes | No |
| 36 | Mothers should be taught how to wipe their baby's teeth when the first tooth erupts after feeding with a soft cloth toothbrush. | (a) Yes | (b) No |
| 37 | It is important to teach mothers to avoid putting their baby to bed with a bottle or Sippy cup containing anything other than water. | (a) Yes | (b)No |
| Oral health assessment | | | |
| 38 | I assess oral health of pregnant mothers on the following (i) Take an oral health history (ii) Check the Mouth for sign of bleeding, cavity or sign of infection. (iii) I document findings (iv) Others (Specify) | (a) Yes (a) Yes (a) Yes | (b)No (b)No (b)No |
| 39 | I give the following advice to pregnant mothers (i) Reassure them about safety of oral health care (ii) Dental visit for every after 6 months | (a) Yes (a) Yes | (b)No (b) No |

Section D: Health Facility factors influencing adoption Oral health promotion

| | | | |
|--|--|--|---|
| Workload | | | |
| 40 | It is easy to adopt oral promotion into antenatal care services because of limited number of staff. | (a) Yes | (b) No |
| 41 | There is no time to promote oral during ANC services | (a) Yes | (b) No |
| Collaboration between oral health professionals and ANC providers | | | |
| 42 | There is a good understanding that exist between dentists and other health workers on prenatal oral care | (a) Yes | (b) No |
| 43 | Oral health promotion for pregnant mothers require inter-professional collaboration | (a) Yes | (b) No |
| IEC Materials available for oral health promotion | | | |
| 44 | I do not access web-sites that focuses on oral health promotion for pregnant mothers | (a) Yes | (b) No |
| 45 | There is no practice guidelines on Oral Health care during pregnancy in this facility | (a) Yes | (b) No |
| 46 | Our facility do not have posters for oral health | (a) Yes | (b) No |
| 47 | Oral health promotion IEC material(s) present at health facility include? | (a) Brochures (b) Videos (c) Mobile phone messages | (d) Flip Charts (e) I do not know (f) Others (Specify) |
| Status of the available dental services | | | |
| 48 | ANC providers can recognize and offer appropriate dental/oral conditions referrals within this health facility | (a) Yes | (b) No |
| 49 | There is no attention given to Oral health of pregnant Mothers in this facility | (a) Yes | (b) No |
| 50 | All oral /dental conditions for pregnant mothers are referred outside this health facility. | (a) Yes | (b) No |
| 51 | Most oral health services are not available | (a) Yes | (b) No |
| 52 | Some oral health services are expensive for the pregnant mothers | (a) Yes | (b) No |
| Level of staff motivation to perform desired strategy | | | |

| | | | |
|----|--|---------|--------|
| 53 | I have never been supported to advance my carrier | (a) Yes | (b) No |
| 54 | I have been given the skills to promote oral health for pregnant mothers | (a) Yes | (b) No |
| 55 | I have always been hard and recognised | (a) Yes | (b) No |
| 56 | Management is good at influencing workers in implementing new practices | (a) Yes | (b) No |
| 57 | We have a common understanding among the staff that is our motivation | (a) Yes | (b) No |

Section E: Strategies for promoting oral health during ANC

| | | | |
|----|---|--|---|
| | Involvement peers of pregnant mothers | | |
| 58 | Is it necessary to involve fellow pregnant mothers in promoting their oral health? | (a) Yes | (b) No |
| 59 | If Yes, why do they need to be involved? | (a) They know there fellows better. (b) Act as role models. | (c) They own the program. (d) Others (Specify)..... |
| | Policy guideline and implementation | | |
| 60 | Do you think it is necessary to involve staff members in formulating policies and review regarding adoption of oral health promotion for pregnant mothers | (a) Yes | (b) No |
| 61 | We need to develop oral health promotion guideline for pregnant mothers | (a) Yes | (b) No |
| 62 | There is need to develop healthy policy that would support oral health for pregnant mothers | (a) Yes | (b) No |
| 63 | My views are important in developing policy and guideline for promoting oral health by ANC providers | (a) Yes | (b) No |
| 64 | What are some of the issues that should be included in oral health promotion guideline for pregnant mothers? | (a) Assessment of pregnant women's oral health status. (b) Ways of improving accesses to oral care. | (c) Oral health education for pregnant mothers (d) Prevention of oral health diseases. |
| | Training on Oral health promotion | | |
| 65 | I am interested in further information about dental care to pregnant women | (a) Yes | (b) No |
| 66 | I have received training on oral health in my field of study | (a) Yes | (b) No |
| 67 | I have the skills to advise pregnant women on oral health. | (a) Yes | (b) No |
| 68 | It is important to design training package for oral health promotion for ANC | (a) Yes | (b) No |
| 69 | Training on basic oral health assessment will be helpful for ANC providers | (a) Yes | (b) No |

Thank you for the response

Appendix C

Consent Form for Key Informants interview

Introduction

Hello; my name is Lulu Patrick Madrama, a Student of Uganda Martyrs University, Faculty of Health Sciences; I am carrying out a research as part of requirement for the award of Master of Public Health-Health Promotion.

The goal of this research is to contribute to the improvement of general health status of mothers and their children through integration of oral health promotion to ANC services.

This interview will take between 10 to 20 minutes in a confidential setting.

Confidentiality; information about you will not be revealed to anyone and the information got will only be used for the purpose of the study, only individuals involved in the data collection will have access to the data collected with no personal names indicated.

Right to withdrawal; it is by choice to participate in this study and you may decide to withdraw from the study whenever you wish and no penalty will be put on you for refusal to continue in the study.

Benefits: Your participation in this study will provide very important information that would help to establish the factors influencing adoption of oral and dental health promotion by Antenatal care providers in Moyo district. Findings from here could also be communicated to policy makers and other stakeholders hence may help improve the situation on the ground.

I, _____ have been adequately informed about the goal, procedure, risks and benefits of this study and have received answers to all questions I had asked. I consent to take part in the study.

Signature: _____ Date: ____/____/____

Participant

In addition, I also hereby consent to having the interview tape-recorded.

Signature _____ Date: ____/____/____

Name: _____ Signature: _____ Date: ____/____/____

Interviewer

Appendix D
Key Informant Guide

Hospital Ownership _____

Professional Qualification: _____

Title: _____

Gender: _____

1. What is your take on adoption of oral health promotion by ANC providers in Health facilities?
2. How do you think the available resources within this facility may influence adoption of oral promotion by ANC providers?
3. What issues are likely to arise in adopting oral health promotion for pregnant mothers and how do we solve these challenges?
4. What are some of the strategies that should be used in adopting oral health promotion in ANC units?

Thank you for your response

Appendix E

Consent Form for Focus Group Participants

My name is Lulu Patrick Madrama, a student of Uganda Martyrs University. I am carrying out a research on factors influencing adoption of oral health promotion by ANC providers.

I am kindly requesting you to kindly acknowledge here if you have understood the purpose of this study and willing to participate in this focus group discussion.

I have \adequately been informed about the goal, purpose, procedure, risks and benefits of this study. I was also given opportunity to ask questions and I am satisfied with responses given to me.

I am aware that I can refuse to participate or withdraw from the study without loss or benefit which I would have otherwise been eligible.

Based on all the information provided, I agree to participate in the study.

Signature or thumbprint: _____

Date: ____/____/____

Appendix F

Focus Group Discussion Guide

1. What are the key issues you wish to be included in adoption of oral health promotion into ANC services?
2. What challenges are likely to arise in adoption of oral health promotion by ANC providers?
3. How do we overcome the above challenges?

Thank you for the response

Appendix G

Selected Health Facilities for the study where ANC is offered and Proportionate to size Sample Size per each facility

| S/No | Health Facility | Health Facility Level | Ownership | Number of ANC providers | Sample Size per Each Facility |
|------|----------------------------|-----------------------|------------------------|-------------------------|-------------------------------|
| 01 | Moyo General Hospital | General Hospital | Government | 106 | 65 |
| 02 | Obongi Health Centre | Health Centre IV | Government | 13 | 08 |
| 03 | Moyo Mission Health Centre | Health Centre IV | Private non for profit | 17 | 11 |
| 04 | Itula | Health Centre III | Government | 12 | 07 |
| 05 | Palorinya | Health Centre III | Government | 09 | 06 |
| 06 | Dufile | Health Centre III | Government | 10 | 06 |
| 07 | Metu | Health Centre III | Government | 10 | 06 |
| 08 | Logoba | Health Centre III | Government | 11 | 07 |
| 09 | Besia | Health Centre III | Government | 08 | 05 |
| 10 | Eria | Health Centre III | Government | 09 | 06 |
| 11 | Lefori | Health Centre III | Government | 09 | 06 |
| 12 | Laropi | Health Centre III | Government | 12 | 07 |
| 13 | Fr.Bilbao | Health Centre III | Private non for profit | 10 | 06 |
| 14 | Erepi | Health Centre III | Private non for profit | 09 | 06 |

Appendix H Recommendation Letter

**Uganda
Martyrs
University**



Making a difference

Faculty of Health
Sciences

Email: health@umu.ac.ug

TO WHOM IT MAY CONCERN

RE: INTRODUCING MR. LULU PATRICK MADRAMA (REG. NO. 2015-M282-20018)

This is to introduce to you Mr. LULU Patrick Madrama as a bona fide student of Uganda Martyrs University. He is pursuing a programme leading to the award of Master of Public Health –Health Promotion

He is collecting data on **'Factors Influencing Adoption of Oral and Dental Health Promotion by Antenatal Care Providers in Moyo District**

Mr. Lulu will be collecting data from the catchment areas of selected facilities in Moyo District.

The relevant university authorities have approved the topic and protocol.

Any assistance rendered to him in this respect will be highly appreciated by the university

Yours sincerely,

DR. Miisa Nanyingi

Faculty of Health Sciences,
Uganda Martyrs University

**Appendix I
Budget**

| S/No | Items | Quantity | Unit cost(UGX) | Total cost (UGX) |
|------|--|-----------|----------------|--------------------|
| 01 | Printing and binding of the proposal | 1 Copy | 30,000/- | 30,000/- |
| 02 | Printing questionnaires for pre- testing | 50 Copies | 1000/- | 50,000/- |
| 03 | Printing questionnaires for data collections | 450 | 1000/- | 400,000/- |
| 04 | Transport to and from Moy district for getting permission and clearance for carrying out data collection | 1 person | 150,000/- | 150,000/- |
| 05 | Transport to the selected Health Units within Moyo district for data collection. | 4 people | 200,000/- | 800,000/- |
| 06 | Communication during the Research | | | 200,000/- |
| 07 | Accommodation and meals during data collection | 30 days | 30,000/- | 900,000/- |
| 08 | Incentives for Research Assistants | 4 People | 150,000/- | 600,000/- |
| 09 | Printing, photocopying and binding preliminary Research Report | 1 copy | 40,000/- | 40,000/- |
| 10 | Printing, Photocopying and binding final copy | 3 Copies | 50,000/- | 150,000/- |
| 11 | Internet surfing for Literature | | | 400,000/- |
| 12 | Supervision fee | | | 500,000/- |
| | Total | | | 4,220,000/- |

Appendix J Work Plan

| S/N O | Activities | March 2017 | April 2017 | May 2017 | June 2017 | July 2017 | August 2017 | Sept 2017 | Oct 2017 | Nov 2017 | Dec 2017 | Jan 2018 | Feb 2018 | March 2018 | April 2018 | May 2018 | June 2018 | July 2018 | August 2018 | Sept 2018 | Responsible Person | |
|----------|--|---------------|---------------|-------------|--------------|--------------|----------------|--------------|-------------|-------------|-------------|-------------|-------------|---------------|---------------|-------------|--------------|--------------|----------------|--------------|-----------------------|------------------------------------|
| 01 | Literature Search and writing of the proposal | | | | | | | | | | | | | | | | | | | | | Researcher |
| 02 | Presentation of Research Topic/Chapter one and three. | | | | | | | | | | | | | | | | | | | | | Researcher |
| | Writing proposal | | | | | | | | | | | | | | | | | | | | | |
| 03 | Approval of Proposal by Supervisor/ Faculty office | | | | | | | | | | | | | | | | | | | | | Supervisor and Faculty office |
| 04 | Approval by DHO | | | | | | | | | | | | | | | | | | | | | |
| 05 | Training Research assistants | | | | | | | | | | | | | | | | | | | | | Researcher |
| 06 | Pre-testing questionnaire | | | | | | | | | | | | | | | | | | | | | Researcher and Research assistants |
| 07 | Data Collection | | | | | | | | | | | | | | | | | | | | | Researcher and Research assistants |
| 08 | Data entry and analysis, interpretation, discussion and submission of first draft. | | | | | | | | | | | | | | | | | | | | | Researcher |
| 09 | Defending Report | | | | | | | | | | | | | | | | | | | | | |
| 09 | Submitting final copy | | | | | | | | | | | | | | | | | | | | | Researcher |
| 10 | Dissemination of results | | | | | | | | | | | | | | | | | | | | | |

Appendix K Map of Uganda



(Source: UN Cartographic section. www.nationsonline.org)

Appendix L
Map of Moyo District

