Research report

Master of Science in Dentistry (MFOS)

FACTORS ASSOCIATED WITH DELAYED PRESENTATION AMONG PATIENTS WITH ORAL CANCER IN MALAWI CENTRAL HOSPITALS.

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Maxillofacial and Oral Surgery.

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Malawi,2023

DECLARATION

I, Nathan Lungu, declare that this Research Report is my own, unaided work. It is being submitted for the Degree of Master of Science in Maxillofacial Surgery and oral surgery at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

(Signature of candidate)

6th day of November

EXECUTIVE SUMMARY

Background: Oral cancer patients are prone to delays in visiting healthcare facilities resulting in delayed diagnosis, poor prognosis, disfigurement of patients, and increase in management costs.

Objective: The aim was to assess factors related to health-seeking delay among patients with oral cancer in Malawi's central hospitals.

Methodology: This research was a descriptive cross-sectional study of patients with oral cancer. The study was conducted in all Malawi referral hospitals' dental clinics from April to June 2023 using a closed-ended, structured questionnaire.

Results: Thirty-six (52.94%) patients visited the hospital when in pain, and 66.18% (n=45) were not aware of oral cancer. A significant statistical relationship (p=0.042) was identified between the delay and reporting to the nearest health care facility.

Conclusion: Lack of awareness, pain and distance to the nearest health care facility were associated with delays. Education and awareness in primary health care can help prevent treatment delays.

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NOMENCLATURE

CHAM: Christian association of Malawi

COMREC: College of Medicine Research Ethics Committee

GP: General Practitioner

HCF: Health care facility

HCP: Health care profession

HNC: Head and Neck Cancer

HREC: Human Research Ethics Committee

KCH: Kamuzu Central Hospital

KHes: Kamuzu University of Health Sciences

MCH: Mzuzu Central Hospital

MK: Malawian Kwacha

QECH: Queen Elizabeth Central Hospital

R: Rand

SCC: Squamous Cell Carcinoma

SOPs: Standard Operating Procedures

SRM: Self-Regulatory Mode

TNM: T- Tumor size, N- Lymph node, M- Metastasis

UK: United Kingdom

Wits: Witwatersrand

ZCH: Zomba Central Hospital

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CHAPTER 1: INTRODUCTION

1.1 General introduction

Worldwide oral cancer is the sixth most common cancer, affecting important structures for respiration, feeding and vision, and a leading cause of illness and death. In developing countries such as India and Tanzania, oral cancer patients visit healthcare facilities in the late stage of the disease. Which results in delayed diagnosis, poor prognosis, and palliative care treatment. Comparatively in developed countries such as the United Kingdom (UK) where oral cancers are usually diagnosed early, (Scott *et al*., 2009; Azhar and Doss, 2018; Gilyoma *et al.,* 2015) there is less disfigurement, and a reduction in management costs of oral cancer patients. (Scott *et al*., 2006).

Among oral cancer patients in developing countries, one of the significant factors contributing to the severity of the disease is a lack of positive health-seeking behavior. This is influenced by a lack of knowledge of oral cancers, culture, religion (Azhar and Doss, 2018), challenges in accessing a health facility and high treatment costs (Scott *et al.*, 2009)

The delay can be stratified into three phases:

1. Patient delay - the time taken for the patient experiencing symptoms of a disease to visit the health care facility (Akram, Siddiqui and Karimi, 2014).
2. Healthcare worker delay - the time from when the healthcare worker has seen the patient with oral cancer symptoms to the time diagnosis is made (Scott *et al.,* 2009)
3. The total delay - the time from when the patient became aware of the symptoms to the time diagnosis is made (Scott *et al.,* 2006).

The symptoms of oral cancer are progressive swelling, localized non-healing ulcers, red and white patches in the oral cavity affecting the tongue, oral mucosa as well as palate and problems in chewing, as well as difficulty in swallow, (Scott *et al.,* 2009). In developing country an estimate of 50% of patients will visit the health care worker within 1-2 months after noticing the symptoms of oral cancer, and 20-30% will visit after more than 3 months (Scott *et al*., 2009).

The health-seeking delay adversely affects the management planning and the treatment outcome of the patient (Msola *et al.*, 2019). Since most of the patients in poor nations depend on public health services, this delay has a huge impact on human capital and material resources (Msola *et al.*, 2019). The delay in seeking care can eventually result in treatment that requires extensive ablative surgeries, a need for more expertise, a longer stay in the hospital, and possible significant morbidity because of structural and aesthetic defects in the patient (Msola *et al.,* 2019).

In a literature search on factors related to health-seeking delay among patients with oral cancer in Malawi, no literature was identified. Hence, this study aims to determine factors related to health-seeking delay among patients with oral cancer in Malawi's central hospitals.

1.2 Objectives

Aim:

The aim was to assess factors related to health-seeking delay among patients with oral cancer in Malawi's central hospitals.

Objectives:

1. To determine the proportion of oral cancer patients associated with delayed presentation among patients with oral cancer in Malawi central hospitals.
2. To determine socioeconomic factors associated with delayed presentation among patients with oral cancer in Malawi central hospitals.
3. To assess the site, type, and stage of oral cancer associated with delayed presentation among patients with oral cancer in Malawi central hospitals.

1.3 Background literature analysis

1.3.1 Demographic factors

A significance association between patients' delayed presentation and low education and social-economic status was reported in the social demographic factors in studies conducted in Sri Lanka (p=0.001) and India (p=.048) (Akram, Siddiqui and Karimi, 2014; Alahapperuma and Fernando, 2017). However, in the UK, no association has been reported in a systematic review between demographic characteristics and patient delay (residence, marital status, and age) (Noonan, 2014). Even though, patients with a low level of education were found to have delayed more in seeking treatment for oral cancer (Noonan, 2014), a study conducted in Nigeria (Bassey, Osunde and Anyanechi, 2014) reported that an increased growth of a tumour with further delay patients in seeking treatment (p= 0.000). Ages of oral cancer patients ranged from 20 to 80 years in Caucasians and from 21 to 40 years in African nations. (Alahapperuma, and Fernando, 2017; Singh *et al*., 2015; Gilyoma *et al.,* 2015). African countries have shorter life expectancies than Western and Caucasian nations, which is ascribed to racial, genetic, social, and behavioral concerns as well as poverty (Bassey, Osunde and Anyanechi, 2014; Gilyoma *et al*., 2015).

1.3.2 Social economic status

The 2015 study conducted by Debsarma, Saha and Ghosh, revealed that socio-economic factors were the major causes of delay among caregivers of children aged under 5-years seeking treatment for fever in India (Debsarma, Saha and Ghosh, 2015). The odds of delay in treatment-seeking behavior of fever were higher among children from the poorest wealth quintile (AOR: 2.06; 95% CI: 1.85, 2.31) (Debsarma, Saha and Ghosh, 2015). Approximately 37.8% of Nebraskans in United States delayed health care due to cost (29.7%) and transportation-related (3.7%) (Ratnapradipa *et al.,* 2013).

In China, a linear-by-linear association testing revealed that health-care delay was significantly associated with social economic status ($P = 0.009$) (Wang *et al.,* 2015).The factors contributing to late presentation of breast cancer according to a systemic review of African women included negative symptom interpretation, fear, belief in alternative medicine, social relations and networks, lack of trust and

confidence in orthodox medicine, and access to healthcare (Donkor, 2015). Education and income were not linked to delays among patients with cancer in a study done in Botswana (Bhatia *et al*.,2018). Cancer patients with larger families had a lower likelihood of experiencing a help-seeking delay (odds ratio [OR], 0.31; P =.03) (Bhatia *et al*.,2018). More than that women and patients with symptoms that were extremely serious had a lower likelihood of experiencing a delay in appraisal (OR, 0.45; P =.032 and OR, 0.14; P =.02, respectively) (Bhatia *et al*.,2018).

1.3.3 Common oral malignant tumor

SCC was reported as being the most malignant tumour among patients delaying seeking treatment in various studies in Tanzania, Sri Lanka, and India (Agarwal, Sethi and Sereen, 2011; Joshi *et al.,* 2014; Msola *et al.*, 2019). The type of SCC was of epithelial in origin according to studies in Tanzania (Gilyoma *et al*., 2015) in head and neck region. While in Nigeria lymphoma was the most common type of HNC (Gilyoma *et al*., 2015). More than that, the buccal mucosa was mostly affected by SCC followed by lower alveolar mucosa with a presentation of 43% and 41% respectively (Singh *et al*., 2015; Singh, Tudur and Kumar, 2018). In Europe and United states, the tongue is the most affected site in the population (Agarwal, Sethi, and Sereen, 2014; Warnakulasuriya, 2009). Numerous authors (Agarwal, Sethi and Sereen, 2014); Singh *et al*., 2015; Singh, Tudur and Kumar, 2018) have reported that 34-62% of patients visited the hospital when cancer is in stage III and IV, and stage I and II ranged from 7.7% to 39% (Agarwal, Sethi and Sereen, 2014).

1.3.4 Malawi health system/ oral cancer pathway

Malawi's population was approximately 17.4 million in 2017 with 64% under 15 years and life expectancy of 58 years was estimated for both genders (Makwero, 2018). The Malawi health system comprises private for-profit, non-profit, and public sector (Makwero, 2018). Moreover, the Ministry of Health offers public services and works with private sector such as the Christian Health Association of Malawi (CHAM) to provide essential health services. Although the public health services are free, but CHAM charges a user fee (Makwero, 2018), the public health system is organized into a primary, secondary, and tertiary level (Makwero, 2018). The tertiary level provides advanced specialized care, secondary services are offered by district

hospitals which serve as a referral point for patients from the primary level (Makwero, 2018).

The primary level of healthcare in Malawi consists of village clinics, dispensaries, and health centers. However, the distance to the nearest health center or dispensary exceeds 10 kilometers (Makwero, 2018). Despite that, a referral process is followed to ensure appropriate healthcare delivery. Patients are directed from dispensaries to health centers, and then further referred from district hospitals to central hospitals (Makwero, 2018). These factors are indicative of the challenges individuals face in accessing these services in Malawi.

The oncology units in Malawi are found at Kamuzu and Queen Elizabeth Central Hospitals where chemotherapy and surgical treatment are offered. Simple procedures such as wide surgical excision are done at QECH, KCH, MCH and Zomba ZCH (Malawi national cancer control strategic plan, 2019-2029). Complicated surgeries are not performed due to lack of specialist doctors and equipment's, (Malawi national cancer control strategic plan, 2019-2029).

1.3.5 Delayed presentation of patients with cancer in Malawi

In Malawi contributing factors to delay in seeking care among cancer patient are limited knowledge of the initial symptoms of cancer and financial constraint (Chadza 2012., *et al*; Ngwira, 2020). Because of this, women with cervical and breast cancer delay for screening, diagnosis and treatment (Chadza *et al.*, 2012). Other factors include long distance and unavailability of cancer screenIng facilities in the health center's (Chadza *et al.,* 2012; Rudd *et al.,* 2017). More than that prolong use of antibiotics before referral of the patients and consultation of traditional healers as well as herbalist (Rudd 2017., *et al*). Patients took 42 weeks to visit the main referral hospital after noticing initial symptoms of cervical cancer (Rudd *et al.,* 2017) in a study done in Malawi. On average, 8 out of every 10 patients seeking medical care at the hospital are in a critical condition that cannot be treated in Malawi.(Nyasa Times, 2013)

1.3.6 Health-seeking behaviors

A study in Tanzania reported that 55.6% of the patients visited health facilities that did not offer oral health services. On average it took 69 weeks to go to Muhimbili National hospital when referred and the reasons for the delay was the absence of pain, and the lack of money for transport (Msola *et al*., 2019). In a study in India (Alahapperuma and Fernando, 2017) reported that patients delaying seeking treatment was associated with low knowledge (p= 0.014) and 52%- 60% of patients presented to the hospital late after noticing symptoms and travelling 10km on average to the nearest health facility (Alahapperuma and Fernando, 2017; Joshi et al.,2014)

According to studies in Sri Lanka and India, (Agarwal, Sethi and Sereen, 2011); (Alahapperuma and Fernando, 2017) most patients (59- 61%) were diagnosed with advanced stage of cancer, which was attributed to delayed presentation (p=0.001) A study by (Akram, Siddiqui and Karimi, 2014) in India reported a significant association of patients delaying for treatment at a health facility and fear (p =0.01) and using herbs (p =0.001). (Agarwal, Sethi and Sereen, 2011) suggests that approximately 70% and 77% of patients have heard about oral cancer, however they were not aware of cancer symptoms. According to Rath *et al.*, (2018), 90% of patients were of the view that symptoms of oral cancer will disappear on their own, 80% went to the hospital because the lesion was increasing in size and 74% were under the influence of society (Rath *et al.*, 2018).

1.3.7 Research question

What are the factors associated with delayed presentation among patients with oral cancer in Malawi central hospitals?

Independent variable: Demographic variables; (age, sex, level of education), social economic status, level of education, organizational factors (long walking distance to the health facility, lack of health personnel at primary Centre).

Dependent variable: Oral cancer, the reason for delayed presentation.

Hypothesis

Null hypothesis

There are no factors associated with delayed presentation among patients with oral cancer in Malawi central hospitals.

Alternative hypothesis

There are factors associated with delayed presentation among patients with oral cancer in Malawi central hospitals.

Significance of the study

This study needs to be done to determine the factors associated with delayed presentation among patients with oral cancer in Malawi central hospitals. This will contribute to the development of strategies to enhance early health-seeking behaviors among patients with oral cancer.

Furthermore, this will contribute to reducing complications, disfigurement, morbidity, and mortality. This study is particularly relevant in Malawi as to the best of our knowledge, no such study has been conducted in Malawi central hospitals, despite an increasing trend of oral cancer like in Iceland, Finland, and Ireland (Chi, Day and Navillile, 2015). However, in Africa, there is limited information in the hospital's records for oral cancer patients, therefore, it is difficult to estimate the actual prevalence of oral cancer (Warnakulasuriya, 2009).

CHAPTER 2: METHODS AND MATERIALS

2.1 Study Area

The study was done in all the dental clinics of major referral hospitals in Malawi, namely: Mzuzu Central Hospital, Kamuzu Central Hospital, Queen Elizabeth Central Hospital and Zomba Central Hospital.

2.2 Study design

This study was a descriptive cross-sectional study.

2.3 Study population

The study population were all patients with oral cancer attending dental clinics in Malawi central hospitals, namely: ZCH, QECH, MCH and KCH.

2.4 Sampling technique

The sampling technique employed for this study was non-probability systematic sampling.

2.5 Sample size

The sample size calculation in consultation with a statistician yielded a sample size of 384 as being adequate for this study.

The sample size was obtained by this formula $N= Z^2 \times P (1-P) / \varepsilon^2$

1.962x0.5 (1-0.5)/0.052=385 where:

N= required sample size

Z = reliability coefficient at 95% confidence interval (standard value of 1.96)

p= proportion of the population with characteristics of interest (0.5)

ε = margin of error at 5% (standard value of 0.05)

2.6 Study period

The research was conducted from February 2022– August 2023 and the collection of data was done from April -June 2023. The study was conducted after the ethical clearance and necessary permissions were obtained for the study.

2.7 Inclusion criteria

This study included all patients who were diagnosed with oral cancer, who visited the dental clinics in four central hospitals in Malawi from April to June 2023.

2.8 Exclusion criteria

1. Patients refusing to consent to the study were not included.
2. Patients not able to provide any of the necessary details.
3. Patients with benign conditions.
4. Patients under 18 years.

2.9 Data collection

A closed ended structured questionnaire adopted from Scott *et al.,* (2009) and Msolla *et al*., (2019) was used for data collection. The questionnaire, information sheet and consent form were translated from English to Chichewa by the department of language, culture, and creative studies at Mzuzu University. The questionnaire was used to collect relevant information on demographic characteristics, and social-economic factors. The diagnosis was recorded from the Pathology Laboratories of the Kamuzu central and Queen Elizabeth central hospital.

A pilot study involving five patients in each central hospital was undertaken during which the questionnaire was presented in all four central hospitals to determine whether it needed any further changes and to adapt it to the local conditions.

Study Instrument Design

The study instrument utilized in this study.

The questionnaire had three sections namely:

Section A: Social -Demographic Information

This section aimed to gather social demographic information from the participants. The following variables were included: age, gender, level of education, income, and occupation. Age was categorized into distinct age ranges, using a grouping interval of 20 years. Marital status was divided into two groups: married individuals (including those who were married or cohabiting). while unmarried individuals consisted of singles, widows, widowers, and divorced individuals.

The level of education was categorized based on different educational milestones or degrees achieved. The following categories were used:

1. Illiterate (without formal education): Participants who had never attended primary school.
2. Educated (formal education) Participants who had attended primary education, finished primary education, attended secondary school, finished secondary school, or obtained a college/university education.

Additionally, income level was categorized as follows:

1. Low income: Participants earning less than or equal to K 50,000 (equivalent to R1000).
2. Medium income: Participants earning between K 50,000 and K 100,000 (equivalent to R1000-R2000).
3. High income: Participants earning more than K 100,000 (equivalent to more than R2000).

Section B: Health seeking behavior

The distance to the nearest health facility was categorized into two groups: less than 10 kilometers and more than 10 kilometers.

Section C: Good health behavior

Participants who reported to the healthcare facility two weeks after noticing symptoms were considered to have experienced a delayed presentation in seeking healthcare.

This was a researcher administered questionnaire, the participants were interviewed using a questionnaire. The answers given were ticked on the questionnaire for both illiterate and literate by the researcher.

2.10 Ethical consideration

The Wits University Human Research Ethical Committee and Kamuzu University of Health Science (COMREC) granted their approval for the study to be conducted in Malawi Central hospitals. Further than that, the Directors and research committee of all central hospitals Zomba, Queen Elizabeth, Kamuzu and Mzuzu approved this study. Additionally, the heads of department in dental units allowed the study to be conducted in their departments. The patients were informed of the study's objectives and given assurances regarding the privacy of their personal data. The participants read the information sheet and then provided their written informed consent. Moreover, the consent form was read to the participant(s) who cannot read or write while they inscribed their thumbprint in agreement on the consent form. Confidentiality and anonymity of participants were maintained by assigning codes to the participant names nor any identifying information was used.

2.11 Data management and Statistical tests

Data was entered into an Excel spreadsheet, the data was cleaned, validated, and analysed using STATA version 17. A p-value of 0.05 or lower was regarded as statistically.

Objectives and Data analysis

Table 2. 1: Objectives and Data analysis

Objective	Variable	Data analysis
1. To determine the proportion of oral cancer patients	Gender Age Level of education Residence Occupation Income	Frequency tables
2. To determine socio-economic factors associated with delayed presentation	Age Level of education Residence Occupation Income Reason of delay	Chi-square percentage Pie chat Logistic regression
3. To assess the site, type, and stage of oral cancer associated with delayed presentation	Oral cancer	Frequency tables Histogram

CHAPTER 3: RESULTS

A total of 56 (82.35%) out of 68 patients who were included in the study delayed in seeking healthcare, which consisted of more females (n=36, 52.4%) than males (n=32, 47.06%). Most of the patients were between 21-40 years (n=26, 38.24%) followed by 41-60 years (n=25, 36.76%) while 5 (7.35%) of the patients were above 60 years (see [**Table 3.1**]).

Table 3. 1: Social- demographic characteristics

Social demographic characteristics	Frequency (68)	Percentage
Sex		
Male	32	47.06
Female	36	52.4
Age group		
>18	12	17.65
21-40	26	38.24
41-60	25	36.76
>60	5	7.35
Education		
Illiterate	51	75
Educated	17	25
Marital status		
Married	39	57.35
Unmarried	29	42.65
Nearest health facility		
Primary	32	47.06
Secondary	23	33.82
Tertiary	13	7.35
Occupation		
Employed	21	30.88
Farmer	39	57.35
Student	8	11.76
Income		
Less than K50,000 (R1000)	51	75
Between K50,000 and K100,000 (R1000-R2000)	11	16.65
More than K100,000 (>R2000)	6	8.3 5

Most of the patients were farmers (n=39, 57.35%) and twenty-one (30.88%) of the patients were employed, while (n=51, 75.88%) were illiterate with a level of income of less than K50, 000 (R1000) a month (n=51, 75%). Fifty patients (73.53%) reported that the distance to the nearest health facility was more than 10 km. The nearest health facility for most (n=62, 91.18%) of the patients was a primary health care facility and (n=1, 1.47%) of the patients were close to the central hospital [**Figure 3.1]**.

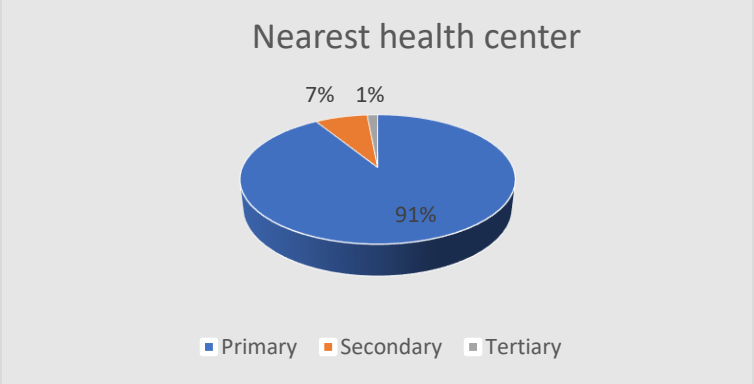

Figure 3. 1: Distribution of patients according to the health facility they attended.

Most of the patients (n=45, 66.18%) reported unavailability of dental services at the nearest health facility. More than that, thirty-two patients (47.06%) were referred from primary healthcare facilities, followed by those who were referred from district hospitals (n=23, 33.82%), while a smaller proportion (n=13, 19.12%) directly arrived at the tertiary health centers without prior referral. Thirty-eight patients (55.88%) were able to inform their relatives when they are sick, and of which (n=22, 32.35%) informed their spouses. Thirty-six patients (52.94%) and (n=31, 45.59%) reported that the main reason for visiting the hospital was pain and increasing symptoms respectively.

Most participants (n=56, 82.35%) experienced a delay in seeking healthcare after recognizing the initial symptoms. Among them, 58.82% (n=40) waited for more than three weeks to six months, 17.65% (n=12) sought care within one to two weeks, and 23.53% (n=16) reported waiting for over 12 months. There was no statistically significant between delayed visit to healthcare facilities after symptom recognition and various social demographic characteristics, including marital status ($p = 0.064$), age group ($p = 0.411$), occupation ($p = 0.170$) and educational level ($p = 0.463$). However, there was a statistically significant correlation ($p = 0.042$) found between the delay in

reporting to the nearest healthcare facility and the distance to that facility. More than that there was a significance of (p = 0.000) between the delayed presentation and the nearest health care facility as well as disclosure of symptoms to a relative or a spouse **[Table 3.2].**

Table 3. 2: Different factors associated with delay.

Factors	Delayed	Not Delayed	Chi-Square	P-Value
Age				
>18	9	3	2.9	0.411
21-40	23	3		
41-60	21	4		
>60	3	2		
Education				
Educated	13	4	0.5	0.463
Illiterate	43	8		
Marital status				
Married	35	4	3.43	0.064
Unmarried	21	8		
Employment				
Employed	16	5	5.02	0.17
Farmer	33	6		
Student	7	1		
Gender				
Male	29	7	0.2	0.68
Female	27	5		
Distance				
Less than 10km	10	6	4.4	0.042
More than 10km	44	8		
Nearest Health facility				
Primary H/C	55	7	19.76	0.000
Secondary H/C	1	4		
Tertiary H/C	0	1		
Disclosure of cancer				
Yes	51	5	12.29	0.000
No	6	6		

In [**Table 3.3**] the most common site for oral cancer was the buccal mucosa, which accounted for (n=26, 38.24%) of the cases. The mandible was the second-most common site, with (n=19,25%).

Table 3. 3: Common site of oral cancer

Site	Freqency	Percent
Buccal mucosa	26	38.24
Mandible	19	25
Maxilla	9	13.24
Palate	8	11.76
Tongue	6	8.82

Figure 3. 2 illustrates that the most common oral cancer was SCC (n=49, 72.6%) followed by adenocarcinoma (n=11, 16.18%) and then sarcoma and lymphoma lastly.

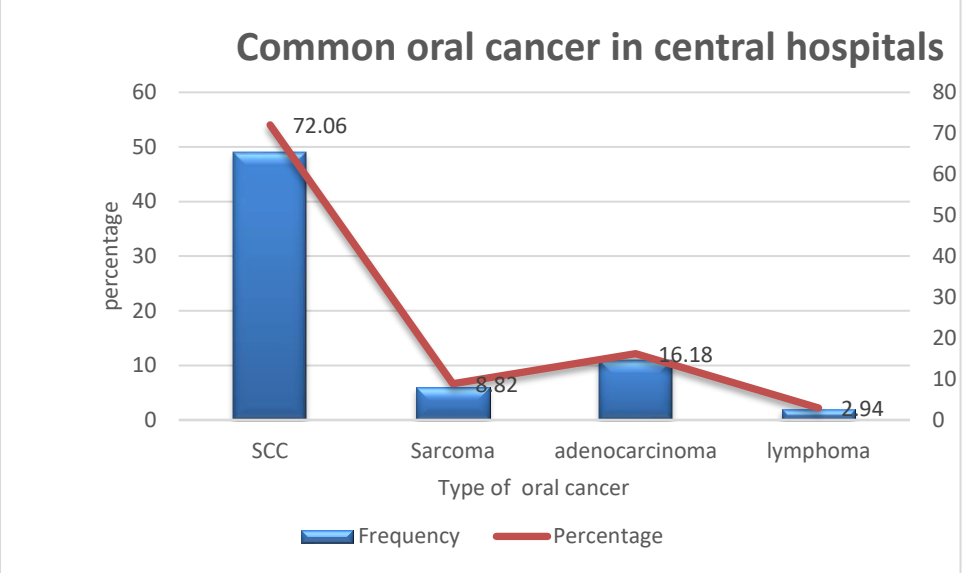

Figure 3. 2: Most common oral cancer

The histology results were available to the patients at one to two weeks (n=47, 69.12%) and more than three weeks (n=21, 30.88%). The patients reported to the health facility when oral cancer was at stage I (n=17, 25%) and stage II (n=41, 60.29%) **[Figure 3.3**]

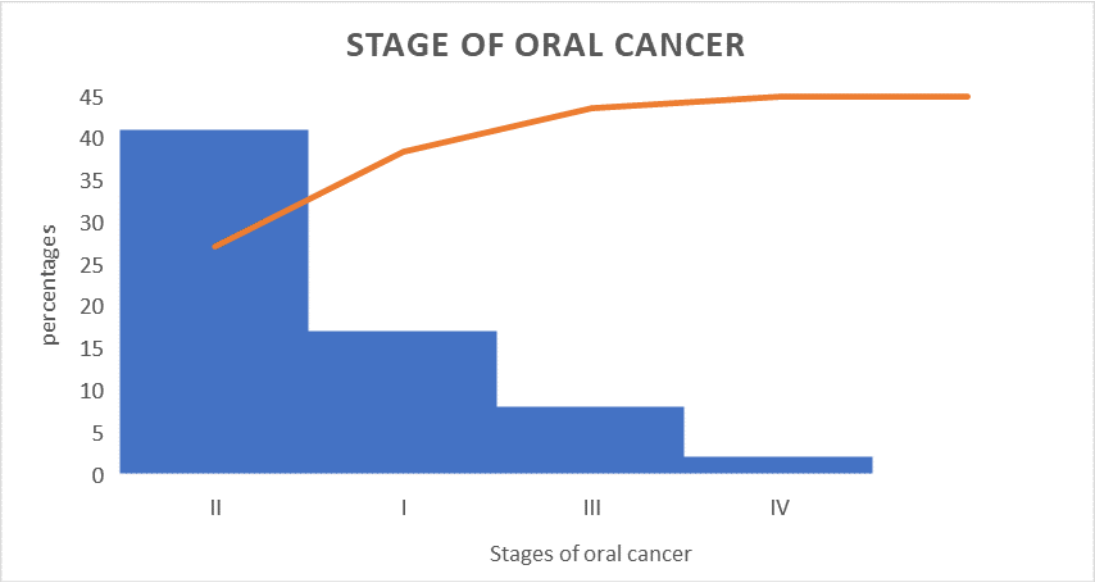

Figure 3. 3.: Stage of oral cancer

Fifty (73.53%) of patients reported that they have never heard of oral cancer and all the patients (n=68, 100%) were not afraid to see the doctor. Most participants (n=45, 66.18%) had already started taking medication prior to their visit to the health facility, with 45 (66.67%) of them self-prescribing the medication. Furthermore, 59 participants (86.76%) stated that they had sufficient time to make a visit to a health facility.

The logistic regression analysis results for factors predicting delayed hospital reporting are presented in **Table 3.4**. There was no statistical significance (p value = 0.584) on an odds ratio of 3.6 which suggests that individuals who are more educated are 3.6 times more likely to have heard about oral cancer in relation to those with a lower level of education. Furthermore, between individuals who are located more than 10km are 3.7 times more likely to have a delayed presentation for treatment compared to individuals who are located less than 10km, the association was statistically significant (p-value 0.05). More than that, the odds ratio of 3.4 suggests that individuals close to primary healthcare (HCF) are 3.4 times more likely to have delayed presentation in seeking treatment unlike individuals located close to secondary and tertiary healthcare, this comparison was statistically significant with a p=0.004.

Table 3. 4: Logistic regression analysis for predictors of late reporting to the hospital

Factor	p-Value (logistic regression test)	0R (95% CI)	
Level of education vs hearing about oral cancer	0.584	3.6 (.1672752	2.739744)
Less than 10km vs more than 10km	0.05	3.7(1.000086	13.44329)
Primary H/C vs Secondary and Tertiary H/C	0.004	3.4 (1.119468	5.775417)

CHAPTER 4: DISCUSSION

Oral cancer is a significant global challenge, with approximately 500,000 patients diagnosed annually, and its occurrence seems to be on the rise in developing nations (Gilyoma *et al*., 2015). In Malawi, oral cancer imposes a substantial financial burden and results in a significantly high morbidity rate. Several factors associated with treatment delays have been identified, including gender, patient age, tumor site, lack of awareness, differences between rural and urban areas, fear of disfiguring surgery, and psycho-social factors (Agarwal, Sethi and Sereen, 2011).

This study was done in all central hospitals of Malawi which serve as the main referral centers in the country. The Malawi healthcare system is not different to that of Tanzania (Msolla *et al*., 2019). In both countries, patients with oral cancer are referred and treated through a similar process. Thus, patients initially seek care at primary healthcare facilities such as dispensaries or health centers, where a clinical diagnosis is made (Msolla *et al*., 2019). Subsequently, they are referred to a district hospital and then to central hospitals, where specimens are collected for histological diagnosis and later treatment (Gilyoma *et al*., 2015; Msolla *et al*., 2019). These findings enhance the understanding of the delay in diagnosis and treatment-seeking among oral cancer patients, and the similarities have been noted in prior studies (Msolla *et al*., 2019; Rath *et al.,* 2018).

Therefore, among malignant lesions based on the histology reports, the current study established that SCC was the most common type of oral cancer. The same results were reported in previous studies in Tanzania (Gilyoma *et al*., 2015) which consistently showed SCC, mainly of epithelial origin in the head and neck. This finding contrasts with a Amusa *et al.,* in Nigeria whereby lymphoma was the most common type of HNC (Gilyoma *et al*., 2015).

Furthermore, like the current study, various studies in India and the UK (Warnakulasuriya, 2009; Rath *et al.,* 2018; Singh *et al*., 2015) have consistently shown that the buccal mucosa is the most affected site by oral cancer. Whereas the tongue is thought to be the most affected site in Europe and the United States population

(Agarwal, Sethi, and Sereen, 2014; Warnakulasuriya, 2009). Further than that, the young age group (21-40 years) was mostly affected in the current study. This is similar to most African countries, compared to Caucasian countries where 20-80 years old were affected in majority (Alahapperuma, and Fernando, 2017; Singh *et al*., 2015; Gilyoma *et al*., 2015). The observed differences might be due to the short life span in Africa compared to western and Caucasian countries, attributed to the issues of race, genetics, poverty, and behavior. (Bassey, Osunde and Anyanechi, 2014; Gilyoma *et al*., 2015).

Moreover, in this study, women were more affected compared to men, the same findings were reported in Tanzania (Msolla *et al.,* 2019). However, this contrasts with numerous studies in India where men were more affected than females (Ravi *et al*., 2005; Agarwal, Sethi and Sereen, 2011). According to the findings of this study, men tend to exhibit a higher tendency to delay seeking medical attention when experiencing oral cancer symptoms compared to women. This could be attributed to the fact that women generally visit healthcare facilities more often to seek help than men (Bhatia *et al*., 2018). But also, women rely on larger social networks for emotional support and advice which potentially reduces the delay (Bhatia *et al*., 2018).

The delayed presentation of oral cancer patients especially men can be attributed to cultural factors whereby men tend to delay the treatment as they are more susceptible to risk factors, such as tobacco smoking and outdoor work (Bassey, Osunde and Anyanechi, 2014). Similarly, Warnakulasuriya (2009) found that oral cancer predominantly affects the most disadvantaged population group, particularly men, excluding young professionals, with a prevalence of 25%. This is not different to the present study where most of affected patients were men from rural areas, especially farmers. Additionally, having a low-income status of less than or equal to K50,000 (R1000) per month which is consistent with research findings in Tanzania and India. (Singh *et al.,* 2015; Msolla *et al.,* 2019; Ruth *et al.,* 2019).

Furthermore, the results of the current study also align with those of research done in Malaysia, which found that patients' knowledge and education levels have an impact

on how they interpret symptoms, use coping mechanisms, and engage in health-seeking behaviours (Azhar and Doss, 2018). Similarly, Scott *et al*., (2009) reported a strong positive correlation between a delayed presentation and inadequate knowledge of head and neck cancer, considering it as one of the three independent predictors of patient delay (Akram, Siddiqui, and Karim*,* 2014). According to several studies, there is a significant association between patient delay and education level, with a p-value of 0.001 (Alahapperuma and Fernando, 2017), although this was not the case in the current study (p = 0.463).

More than that, Singh *et al.,* (2015), Agarwal, Sethi and Sereen*,* (2011), and *Gilyoma et al.,* (2015), reported that patients predominantly presented to the clinic at late stages III and IV. While in the current study most patients reported at stages I and II. The difference might be because this study was based on patients reporting to the dental clinic excluding severely sick patients (Gilyoma *et al.,* 2015). Late-stage presentation, specifically at Stage III and IV, of oral cancer is common among patients in developing countries, and this trend can be attributed to factors such as limited access to healthcare services, poverty, and ignorance, (Gilyoma *et al.,* 2015). Similar factors were noted in this study, such as patients living in rural locations more than 10 kilometers from the closest HCF. This finding was statistically significant, as indicated by the p-value of 0.042.

Furthermore, most patients in this study reported farming as their occupation, which coincides with low-income levels. This higher occurrence of SCC especially among farmers might be attributed to continuous exposure to the sun and carcinogens present in the chemical composition of fertilizers (Gilyoma *et al*., 2015). However, once the malignant lesions are diagnosed at Stage I, a cure rate of more than 90% is noted (Basharat *et al.,* 2019). Early detection and timely interventions are crucial in enabling individuals to accurately evaluate oral symptoms, thereby reducing the risk of misinterpretation, and associated harmful behaviors like prolonged self-medication (Scott *et al.,* 2009). This will enhance the chances of successful treatment, the preservation of function, aesthetics, survival rate and psychological outcome (Llewellyn, John and Warmakulusuriya, 2004; Gilyoma *et al.,* 2015; Basharat *et al.,* 2019).

Hence it is essential to know that oral mucosa lesions typically heal within a two-week timeframe. Therefore, any oral mucosal changes persisting for three weeks should be considered suspicious and promptly examined by a healthcare professional (Scott *et al.,* 2009). It is estimated that cancer progress at the rate of 0.045 of a stage within a week of delay, therefore its necessary to investigate factors associated with diagnostic delay (Alahapperuma and Fernando, 2017). According to Scott *et al.,* (2009), providing a specific duration for concrete symptoms can effectively reduce patient delay in seeking intervention.

However, similar to this study, in the early stages of oral cancer, patients frequently disregard painless lesions (Azhar and Doss, 2018). But tend to visit the health care facility when in pain or upon worsening of symptoms (Azhar and Doss, 2018). Likewise, Noonan (2014) reported that the persistence of symptoms was perceived as a signal that something was wrong, prompting individuals to seek medical attention. The intensity of symptoms affects the time for an individual to seek medical care (Scott *et al.*,2009). Hence, the cognitive and emotional reactions to symptom detection, personal beliefs about seeking assistance, and the contextual factors surrounding symptom manifestation all contribute to the decision-making process regarding seeking help (*Scott et al*., 2009).

Moreover, Bassey, Osunde and Anyanechi, (2014) in their study reported that fear was a significant factor contributing to the delay in seeking treatment. Several studies have also indicated that an increase in fear is related to a higher likelihood of seeking help earlier, although the underlying reasons remain unclear (Bassey, Osunde and Anyanechi*,* 2014; Azhar and Doss, 2018). In this study, recognition of symptoms did not delay seeking treatment, however, delay was associated with disclosing symptoms (p=0.000) and was statistically significant. Nevertheless, disclosing symptoms to others and patient delay was not statistically significant (Bassey, Osunde and Anyanechi*,* 2014).

Literature (Azhar and Doss, 2018) has shown that, as oral cancer progresses in TNM staging there is persistence of symptoms, increasing concern and worry among patients. As there is deterioration of oral function affecting emotional well-being of individuals and overall quality of life, motivating patients to seek medical care (Azhar and Doss, 2018). This has been explained through the utilization of the Self-Regulatory Model (SRM). To understand the cognitive processes and mechanisms involved in individuals' perception and response to health threats (Noonan, 2014; Azhar and Doss, 2018). The SRM provides insights into the underlying reasons behind the delay (Noonan, 2014; Azhar and Doss, 2018).

The model proposes that participants have four types of coping mechanisms; self-remedy based on previous experience, self-medication such as pills and mouthwashes, and consulting traditional healers', which are cheap means and readily accessible and little time cost than consulting GPs (Azhar and Doss, 2018). Psychologically, these coping mechanisms result in delayed presentation of patients to the HCF (Noonan, 2014) this was observed in this study whereby patients took self-medication before seeing a clinician and hoping that the lesion will heal on its own. Thus, the application of the SRM can widen our knowledge of the processes behind patients' delay (Noonan, 2014; Azhar and Doss, 2018).

Many researchers (Basharat *et al*., 2019; Bhatia *et al*., 2018) have discussed the factors that affect patients with malignant melanoma, oral cancer, and breast cancer to delay for treatment. Factors like the severity of symptoms, anxiety, and humiliation, can contribute to delayed medical attention in patients with breast cancer (Bhatia *et al.,* 2018). Likewise, individuals with ovarian cancer may also associate significant symptoms with an existing benign condition or coexisting illness (Bhatia *et al.,* 2018). But quick identification of specific symptoms, such as a breast lump, reduces the delay in seeking medical attention compared to patients with nonspecific symptoms **(**Bhatia *et al*., 2018).

There have been studies on the delayed presentation of patients with oral cancer in Tanzania, India, and London (Msola *et al.,* 2019; Basharat *et al*., 2019). Although the

length of the delay varies, some reports noted that there is 31days to 2 years from the time the first signs of oral cancer are noticed until the patient sees a health personnel (Scott *et al.,* 2009; Warnakulasuriya, 2009; Msolla *et al*., 2019; Basharat *et al*., 2019). Similarly, there was a period of 2–6-month delay noted in this study. Professional delay can also impact the treatment modalities for patients, even if they arrive at the hospital in time (Rath *et al.,* 2018). The current study provided evidence that aligned with this, where it was found that histology reports took one to two weeks to become available to the patients, although this aspect was not the focus of this present study.

Limitations of the study

The sample size was small, and the duration of data collection was short. Diseases like oral cancer need a longer duration hence, it is difficult to generalize the findings. Another challenge encountered was measurements of patients' delay. The patients had to recall when they first noticed the symptom and presented it to the physician, this is prone to errors due to recall bias. In addition, this study concentrated on patients who came for treatment at a referral hospital but did not consider patients who did not present themself for treatment. Further than that, the histological results took more than three weeks to be available to the patients, hence some patients who were still waiting for the results were missed during data collection. Lastly, clinical staging of oral cancer using TNM might be prone to errors as it depends on the examination of the patient by a clinician.

Recommendations

This study focused on factors contributing to delayed presentation among oral cancer patients to seek treatment. Hence, educating the community about oral cancer presentation and early health-seeking behaviors are essential. This is because, most of the participants in this study did not know about oral cancer and reported delayed presentation to seek treatment. Furthermore, it is essential to educate the HCP about early cancer symptoms, to refer the patient for further management at an early stage. It is important that the HCP and pharmacist should be trained to prevent delays in diagnosis and ultimately improve the well-being of patients. In addition to that there must be SOPs for monitoring pre-cancerous lesions at any health care facility.

Further research is warranted to investigate the factors contributing to healthcare provider (HCP) delays in managing patients with oral cancer. The current study focused specifically on the delayed presentation of patients after they noticed symptoms, thus limiting the scope to patient-related factors of oral cancer. Therefore, conducting another study specifically targeting HCP delays would provide valuable insights into this aspect of oral cancer management.

Conclusion

In all central hospitals, oral cancer was common among the young age group at diagnosis. Most of the participants at stage I and II cancer reported delayed presentation for treatment. In the current study, several factors were found to be important causes of the delayed presentation of oral cancer patients. These included socio-economic problems, such as living far from healthcare facilities, the lack of dental staff at primary healthcare facilities, a lack of knowledge about oral cancer, and the delay in receiving histopathological results. Therefore, education and awareness campaigns should be used as a tool for guidance towards intervention programs to reduce patient delayed presentation at the primary health care level. This can be done at a community level and offering continuing education to dental health personnel as well as health care workers practicing at primary health care facilities.

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APPENDICES

APPENDIX A: Questionnaire

Dear participant,

This questionnaire is for collecting information about factors associated with delayed presentation among patients with oral cancer in Malawi central hospitals The answers will be confidential. I will not put your name on the questionnaire only numbers. I have questions with answers which you will choose, and I will be ticking the answer given. Your participation is highly appreciated.

Demographic features (Tick where appropriate)

1. Gender: Male ☐ Female ☐

2. Age: 0-20 ☐ 21-40 ☐ 41-60 ☐ > 60 ☐

3. Level of education: Never gone to school ☐
   Didn't finish primary school ☐ Finished primary schoo ☐
   Never attended secondary school ☐ Attended secondary school ☐
   College education/ university ☐ Other ☐

4. Marital status: Single ☐ married ☐
   Widow ☐ Widower ☐
   Divorce ☐ Cohabitin ☐ Other ☐

5. Hospital attends to: Queens ☐ Zomba ☐ Lilongwe ☐
   Blantyre ☐ Referred from which district ☐

6. Occupation: Farmer ☐ Employed ☐ Self-employed/ business ☐
   Retired ☐ Student ☐ Housewife ☐ Artist ☐ specify ☐
   Religion ☐ Christian ☐ Moslem ☐ Other ☐ None ☐

8. How much do you earn a month: Less than 100USD (MK50, 000 ☐
   200-500USD (MK50- 100,000 ☐
   >500USD(>MK100,000) ☐

Health seeking behaviour

Availability and accessibility of oral health services

1. Distance to nearest health centre: Less than or equal to 10kms ☐
   Greater than 10kms ☐

2. Nearest health facility: Dispensary ☐ Health centre ☐
   District hospital ☐

3. Availability of dental personnel: Yes ☐ No ☐

Good health behaviours

4. When did you visit the doctor after noticing the symptoms?
   1-2 weeks ☐ 3 weeks -1 month ☐
   2-6months ☐ 7-12 months ☐ More than 12 months ☐

5. Did you tell anyone that you have a problem? if yes then go to question number 6.
   Yes ☐ No ☐

6. If yes who: Spouse ☐ Relatives ☐ Friends ☐ Father ☐
   Mother ☐ Workmates ☐ Grandmother/ grand father ☐

7. Did you take any medication before going to the hospital? if yes go to question 8
   Yes ☐ No ☐

8. How did you get the medication: Over the counter / Self medication ☐
   Health care provider ☐

9. Were you afraid to go to the hospital for treatment: Yes ☐ No ☐

10. Do you have time to see a doctor when you are sick? If yes go to question 11
    Yes ☐ No ☐

11. If no what are the reasons: Not painful ☐ Symptoms are minor ☐
    Busy with work ☐ Responsible for the family ☐

12. What made you go to the hospital: Feeling pain ☐ symptoms were increasing ☐
    Was told by others ☐

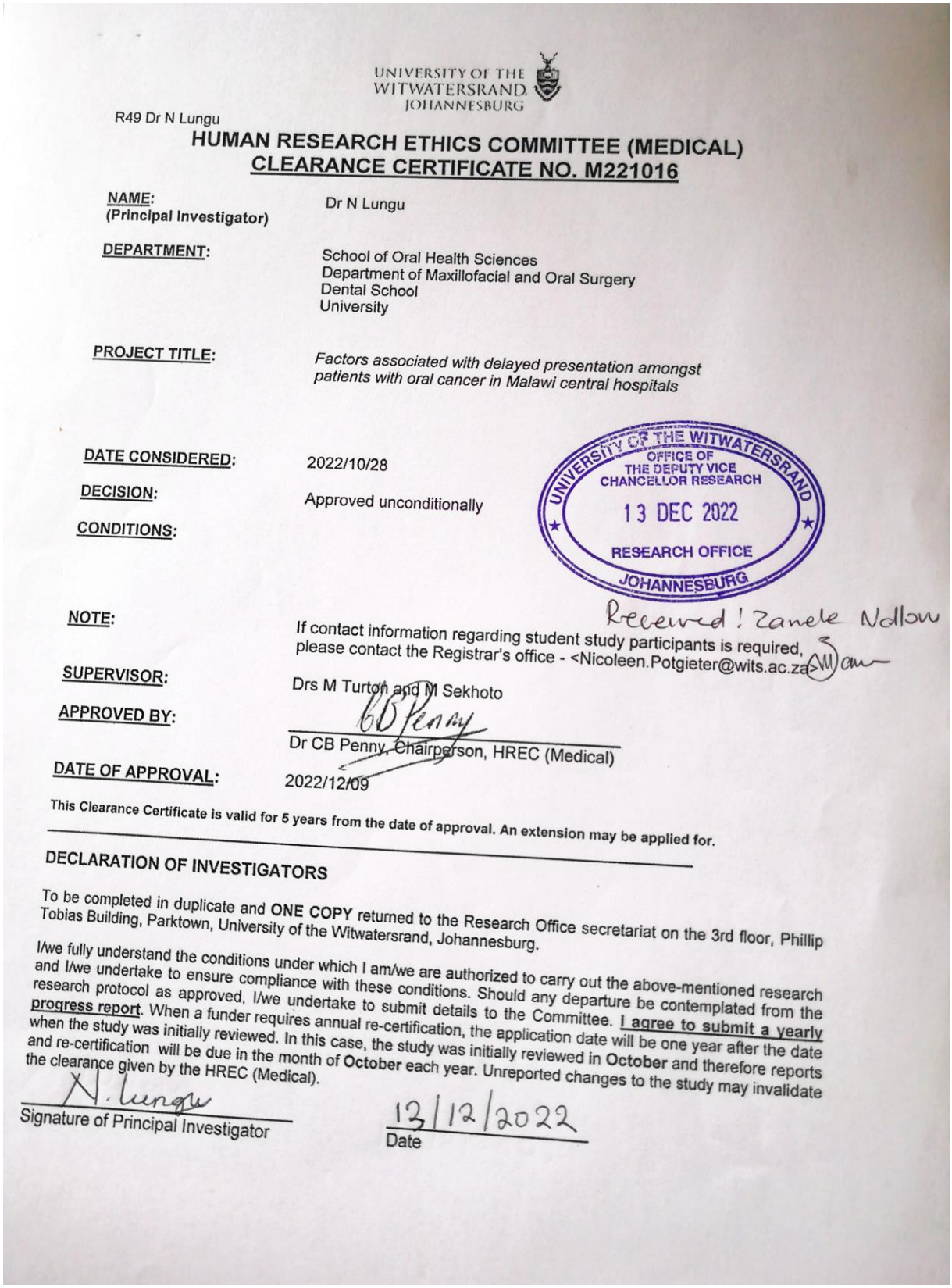
13. Confirm the diagnosis with histology results …….

14. Not confirmed ☐

15. Have you heard about oral cancer: Yes ☐ b No ☐

APPENDIX B

Ethical clearance from Human Ethics committee University of Witwatersrand



UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

R49 Dr N Lungu

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M221016

NAME: (Principal Investigator) Dr N Lungu

DEPARTMENT: School of Oral Health Sciences
Department of Maxillofacial and Oral Surgery
Dental School
University

PROJECT TITLE: *Factors associated with delayed presentation amongst patients with oral cancer in Malawi central hospitals*

DATE CONSIDERED: 2022/10/28

DECISION: Approved unconditionally

CONDITIONS:

UNIVERSITY OF THE WITWATERSRAND
OFFICE OF THE DEPUTY VICE CHANCELLOR RESEARCH
13 DEC 2022
RESEARCH OFFICE
JOHANNESBURG

Received ! Zanele Ndlovu

NOTE: If contact information regarding student study participants is required, please contact the Registrar's office - <Nicoleen.Potgieter@wits.ac.za>

SUPERVISOR: Drs M Turton and M Sekhoto

APPROVED BY: CB Penny
Dr CB Penny, Chairperson, HREC (Medical)

DATE OF APPROVAL: 2022/12/09

This Clearance Certificate is valid for 5 years from the date of approval. An extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office secretariat on the 3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report**. When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in **October** and therefore reports and re-certification will be due in the month of **October** each year. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).

N. Lungu
Signature of Principal Investigator

13/12/2022
Date

APPENDIX: C: Ethical clearance from college of medicine Research Ethics

Committee Malawi

CERTIFICATE OF ETHICS APPROVAL

This is to certify that the College of Medicine Research and Ethics Committee (COMREC) has reviewed and approved a study entitled:

P.02/23/3999 - Factors associated with delayed presentation among patients with oral cancer in Malawi central hospitals by Nathan Lungu

On 14-Apr-23

As you proceed with the implementation of your study, we would like you to adhere to international ethical guidelines, national guidelines and all requirements by COMREC some of which are indicated on the next page for your study

14-Apr-23

Prof. E. Umar -Chairperson (COMREC)

Date

Approved by College of Medicine
14-Apr-2023
(COMREC)
Research and Ethics Committee