

**PREVALENCE OF EDENTULISM AMONG MOTORCYCLE AND TRICYCLE
RIDERS IN UGBOWO, BENIN CITY, EDO STATE**

BY

ODION PRESTON AGBONKONKON DEN1709509

LAURENTTA IRHARHA EKPADA DEN1702332

VOTE AIYEBBOSA EGHAREVBA DEN1608714

OYINUA OSARUMEN OGOSI DEN1702342

AMARACHI ELUOJO AKPALA DEN1702325

**A RESEARCH PROJECT PRESENTED TO THE DEPARTMENT OF COMMUNITY
DENTAL HEALTH, SCHOOL OF DENTISTRY, UNIVERSITY OF BENIN IN
PARTIAL FULFILLMENT OF REQUIREMENTS FOR THE AWARD OF THE
DEGREE OF BACHELOR IN DENTAL SURGERY (BDS) OF THE UNIVERSITY OF
BENIN, BENIN CITY**

JANUARY, 2025

DECLARATION

We, Odion Preston Agbonkonkon DEN..., Laurentta Irharha Ekpada DEN..., Vote Aiyevbosa Egharevba DEN., Oyinua Osarumen Ogosi DEN..., Amarachi Eluojo Akpala DEN... hereby declare that this research titled “PREVALENCE OF EDENTULISM AMONG TRICYCLE, MOTORCYCLE AND BICYCLE RIDERS IN UGBOWO, BENIN CITY, EDO STATE” is original research carried out by us in the Department of Community Dental Health, University of Benin for the award of the Degree Bachelor of Dental Surgery (BDS).

Odion Preston AGBONKONKON (DEN1709509)

Laurentta Irharha EKPADA (DEN1702332)

Vote Aiyevbosa EGHAREVBA (DEN1608714)

Oyinua Osarumen OGOSI (DEN1702342)

Amarachi Eluojo AKPALA (DEN1702325)

CERTIFICATION

I hereby certify that this research work titled “**PREVALENCE OF EDENTULISM AMONG TRICYCLE, MOTORCYCLE AND BICYCLE RIDERS IN UGBOWO, BENIN CITY, EDO STATE**” was supervised by me.

DR LAWRENCE IGBINOSA

BDS, MPH, MSc, FMCGDP

Project Supervisor

Department of Oral Radiology and Diagnosis

School of Dentistry

University of Benin, Benin City

CERTIFICATION BY HEAD OF DEPARTMENT

I hereby certify that this research work titled **PREVALENCE OF EDENTULISM AMONG TRICYCLE, MOTORCYCLE AND BICYCLE RIDERS IN UGBOWO, BENIN CITY, EDO STATE** was carried out in the Department of Community

Dental Health.

Prof. Sunny Ajimen Okeigbemen

BDS, MPH, FMCDS

Project Coordinator

Head of Department Community Dental Health

School of Dentistry

University of Benin

DEDICATION

We dedicate this project to the Almighty God for His benevolence towards us and for His grace to reach the successful conclusion of this project. We also dedicate this project to our families whose moral and financial support brought us this far. This work is also dedicated to our teacher who have guided us through this work: Dr L.O. Igbiosa , and others too numerous to mention.

ACKNOWLEDGEMENTS

We wish to express my profound gratitude to the Department of Community Dental Health, School of Dentistry, University Of Benin for the opportunity to carry out this study.

It is with deep humility and great respect that we would like to express our utmost gratitude to Dr Igbinosa L.O. for his guidance, patience, support and understanding during the supervision of this project.

Special thanks to Prof. S.A, Okeigbemen for his support throughout the course of this work, our parents and siblings for their prayers and support, and to all our friends too numerous to mention who contributed in one way or the other to the success of this project.

TABLE OF CONTENTS

	TITLE PAGE	i
	DECLARATION	ii
	CERTIFICATION	iii
	DEDICATION	v
	ACKNOWLEDGEMENT	vi
	TABLE OF CONTENTS	vii
	LIST OF ABBREVIATIONS	viii
	LIST OF TABLES	ix
	LIST OF FIGURES	x
	ABSTRACT	xi
	CHAPTER ONE	1
	CHAPTER TWO	6
	CHAPTER THREE	8
	CHAPTER FOUR	13
	CHAPTER FIVE	36
	CONCLUSION	39
	RECOMMENDATIONS	40
	REFERENCES	41
	APPENDIX	44

LIST OF ABBREVIATIONS

1. BDS: Bachelor of Dental Surgery
2. GELA: Global Education and Learning Alliance (as per your professional background)
3. IFEHL: International Federation of Environmental Health
4. LMICs: Low- and Middle-Income Countries
5. MDCN: Medical and Dental Council of Nigeria
6. RTA: Road Traffic Accident
7. SPSS: Statistical Package for Scientific Solutions
8. UBTH: University of Benin Teaching Hospital
9. WHO: World Health Organization

List of Tables

Table 1: Sociodemographic characteristics of respondents

Table 2: Oral health history, frequency of visits, and barriers to care

Table 3: History of tooth loss and accidents

Table 4: Association between sociodemographic factors and edentulism

Table 5: Use of protective gear and safety practices

Table 6: Knowledge of oral health practices

Table 7: Lifestyle and health behaviours including smoking and alcohol use

List of Figures

Figure 1: Knowledge of oral health practices among respondents

ABSTRACT

Background: Edentulism is a significant public health issue that impairs nutrition and quality of life. While global prevalence is high among the elderly, specific occupational groups like commercial riders in low-resource settings face unique risks due to road traffic accidents (RTA) and poor access to dental care.

Objective: To evaluate the prevalence, aetiology, and preventive strategies for edentulism among motorcycle and tricycle riders in Ugbowo, Benin City.

Methodology: A descriptive cross-sectional study was conducted among 260 motorcycle and tricycle riders in Ugbowo, Edo State. Data were collected using structured, interviewer-administered questionnaires and analysed using SPSS version 29.0.

Results: The prevalence of edentulism (history of tooth loss) among the respondents was 12.3% (n=32). Road traffic accidents were a significant factor, with 33.8% of riders having experienced a crash and 19.3% of those sustaining oral injuries. Common injuries included teeth being knocked out (58.8%), chipped (11.8%), or loosened (11.8%). Non-accidental causes of tooth loss included physical assaults (36.4%) and dental caries (27.3%). Statistical analysis showed a significant association between edentulism and experiencing an RTA ($p = 0.047$), as well as sustaining direct mouth injuries ($p < 0.001$). Despite these risks, 80.8% of riders never used a helmet, largely because they perceived them as “not needed” (77.6%). Additionally, 80.4% had never visited a dentist.

Conclusion: Edentulism represents a notable burden among riders in Ugbowo, driven by a combination of occupational trauma and poor oral health behaviours. The high rate of dental injuries and low use of protective gear underscore the need for targeted safety interventions.

Recommendations: The study recommends mandatory use of full-face helmets, the incorporation of seat belts in tricycles, and community-based oral health programs to encourage routine dental visits and preventive care.

Keywords: Edentulism, Tooth loss, Motorcycle riders, Tricycle riders, Road Traffic Accidents, Benin City.

CHAPTER ONE

INTRODUCTION

1.1 Background

Edentulism, the complete loss of all natural teeth, is a significant public health concern globally, particularly among older adults. It can lead to impaired nutrition, reduced quality of life, and increased healthcare costs. The prevalence of Edentulism varies widely across different regions and populations, influenced by factors such as socioeconomic status, access to dental care, and cultural practices.

Globally, Edentulism is a significant public health issue, particularly among the elderly. The World Health Organization (WHO) estimates that approximately 30% of adults aged 65 years and older are edentulous.¹ However, in low- and middle-income countries, including many parts of Sub-Saharan Africa, the prevalence of Edentulism is still considerably high due to factors such as poor access to preventive care, limited availability of affordable dental services, and high rates of dental diseases.

In developed countries, the prevalence of Edentulism has declined over the last few decades, largely due to advances in preventive dentistry and the widespread availability of dental treatments. Studies from Benin City suggest that oral health conditions such as tooth decay, gum disease, and Edentulism are common among low-income groups. Research conducted by Akpata et al. (2003) found that individuals from lower socio-economic strata in Benin City faced higher rates of edentulism.² This underscores the fact that in low-income regions such as Sub-Saharan Africa, Edentulism rates remain high. A report by the WHO shows that the prevalence of tooth loss in older populations in these regions can exceed 30%.¹

Sub-Saharan Africa faces a substantial burden of edentulism, with prevalence rates among older adults often exceeding 20% in various countries.³ In Nigeria, the prevalence of

edentulism among adults aged 65 and older is estimated at approximately 19%, but the rates are much higher in rural and underserved urban areas due to limited access to preventive and restorative dental care.⁴ The leading causes of edentulism in Sub-Saharan Africa include untreated dental caries, periodontal diseases, and lack of access to affordable dental treatments

In Ugbowo, a locality in Benin City, the population of bicycle and tricycle riders plays an integral role in the community's transport network. Specific data on the prevalence of edentulism among bicycle and tricycle riders in Ugbowo, Nigeria, is currently lacking. This gap underscores the need for localized studies to understand the oral health challenges faced by this specific occupational group.

1.2 STATEMENT OF PROBLEM

Bicyclist are seen as vulnerable road users because they face a significant risk of injury in accidents involving vehicle.^{5 6} The absence of dedicated bicycle paths or lanes compels cyclists to share the road with other motor vehicles ⁷, rising competition for space on public roads increase the risk of accidents for cyclist. ⁸

Head and facial injuries are some of the most frequently occurring injuries related to bicycle accidents,⁹ bicycling accidents have been reported as the cause of 1.1-1.8% of all facial fractures across various countries .¹⁰ Managing dental injuries in patients with maxillofacial trauma can be both time intensive and costly, often requiring more extensive treatment than facial fracture itself.

The severity of bicycle accidents is also significantly influenced by the lack of safety equipment usage like helmet. ¹¹Trauma to the teeth is common because of the effect on the head and tooth avulsion is among the most serious types of dental injuries. Tooth avulsion is

the complete displacement of a tooth from the alveolar socket also called exarticulation. Research conducted at a public dental service revealed that bicycles were the commonest cause of dental avulsion, responsible for 31.2% of cases.⁸

The time between the dental injury and receiving treatment plays a crucial role in determining the treatment outcome.¹² Given that avulsion is among the most serious type of dental injuries, the time elapsed before they get treatment is of great importance to prognosis of the treatment. Delayed or lack of dental treatment can lead to colour changes, sensitivity, pain, necrosis and eventual tooth loss.^{12 13} Delay in implanting the avulsed tooth or lack of management is tooth loss which is partial edentulism and this become more with reoccurring trauma.

Although the prevalence of dental trauma has been studied in Turkey, no research has been conducted on orofacial or dental trauma in adults while cycling.¹⁴ The aim of this study is to determine the prevalence of dental trauma leading to edentulism among bike and bicycle riders and to evaluate the attitude and knowledge of the cyclist to the prevention and treatment in Nigeria.

1.3 JUSTIFICATION OF STUDY

Investigating edentulism among bicycle and tricycle riders in Ugbowo is essential for several reasons. Foremost, bicycle and tricycle riders may have unique occupational exposures and lifestyle factors that influence their oral health. Understanding these factors can inform targeted interventions. In addition, identifying the prevalence and determinants of edentulism in this group can guide the allocation of healthcare resources and the development of community-specific oral health programs. Data from such studies can inform policymakers in creating regulations and programs aimed at improving oral health among vulnerable occupational groups. Establishing baseline data on edentulism in this population can serve as a reference for future studies and help in monitoring trends over time.

In conclusion, conducting a study on Edentulism among motorcycle and tricycle riders in Ugbowo is crucial for developing targeted interventions, informing policy decisions, and ultimately improving the oral health and quality of life of this population.

1.4 RESEARCH QUESTION

What is the prevalence of Edentulism among bike and tricycle riders?

What are the main causes of tooth loss among the group of people?

How effective are protective measures like helmets and mouth guards in reducing dental injuries?

What preventive measures can be recommended to minimize Edentulism among riders?

1.5 GENERAL OBJECTIVE

To evaluate the prevalence, aetiology and preventive strategies for edentulism among bicycle, motorcycle and tricycle riders.

1.6 SPECIFIC OBJECTIVES

To determine the common causes of edentulism among bicycle, motorcycle and tricycle riders.

To analyse the impact of accidents and injuries on tooth loss.

To evaluate the use of protective gears and its effectiveness in reducing dental injuries.

To propose recommendations for preventive measures

CHAPTER TWO

LITERATURE REVIEW

2.1 GLOBAL AND REGIONAL PREVALENCE OF EDENTULISM

Edentulism, the complete loss of natural teeth, is a major public health burden, particularly among older adults. Globally, the World Health Organization (WHO) estimates that 30% of adults aged 65+ are edentulous, with higher prevalence in low- and middle-income countries (LMICs) due to limited access to dental care and preventive services¹⁴. In Sub-Saharan Africa, Edentulism rates among older adults often exceed 20%, driven by untreated dental caries, periodontal diseases, and socioeconomic barriers¹⁵. Nigeria reflects this trend, with rural and underserved urban areas reporting higher rates of tooth loss (19% among adults aged 65+) compared to urban centres¹⁶. Socioeconomic disparities further exacerbate these inequalities, as evidenced by studies in Benin City linking low-income status to poor oral health outcomes².

2.2 OCCUPATIONAL RISK AND DENTAL TRAUMA AMONG MOTORCYCLE RIDERS

Motorcycle and tricycle riders, as vulnerable road users, face elevated risks of maxillofacial injuries due to frequent road accidents. Studies highlight that 1.1–1.8% of facial fractures globally result from cycling accidents⁹, with dental avulsion (complete tooth displacement) accounting for 31.2% of trauma cases in some populations¹⁹. In low-resource settings like Sub-Saharan Africa, the absence of dedicated cycling lanes and safety equipment (e.g., helmets) amplifies these risks¹⁰. Despite evidence from Brazil and Turkey linking cycling to dental trauma^{10, 21}, data from Nigeria remain scarce, particularly among adult riders in occupational settings.

2.3 CONSEQUENCES OF DENTAL TRAUMA AND DELAYED TREATMENT

Dental injuries, if untreated, lead to severe complications such as pulp necrosis, infection, and eventual tooth loss²². Delayed treatment significantly worsens prognosis, with studies reporting that only 2–5% of avulsed teeth are replanted successfully in low-income regions²³. This contributes to partial or complete Edentulism, further impairing nutrition, speech, and psychosocial well-being. In occupational groups like bicycle riders, recurrent trauma and poor access to emergency dental care compound these challenges, perpetuating cycles of tooth loss.

2.4 GAP IN EXISTING RESEARCH

While global frameworks emphasize oral health equity (Petersen & Ogawa, 2010), few studies focus on occupational hazards in LMICs. Research in Nigeria has predominantly examined general populations, neglecting high-risk groups like bicycle riders. Additionally, the effectiveness of preventive measures (e.g., mouth guards, community education) remains understudied in Sub-Saharan Africa, limiting evidence-based interventions.

2.5 LINK TO CURRENT STUDY

This study addresses critical gaps by investigating edentulism among bicycle and tricycle riders in Ugbowo, Benin City. It evaluates:

- The prevalence and aetiology of tooth loss in this occupational group.
- The role of cycling accidents in dental trauma.
- Awareness and utilization of protective gear.

Findings aim to inform targeted policies, such as subsidized dental care programs and road safety campaigns, aligning with WHO goals for universal oral health coverage.

CHAPTER THREE

METHODOLOGY

3.1 STUDY AREA

The study area that will be used is Ugbowo, Egor Local Government Area, Benin City, Edo State, Nigeria. It's one of the three local government areas that majorly make up Benin City, the capital of Edo State. It located along the Benin-Lagos Expressway²⁵. Ugbowo is bounded by Ekenwan Road area to the North and the Ogba River to the South. To the East Ugbowo shares a boundary with New Benin and to the West, Ugbowo is surrounded by the Oluku area. It is located between Latitudes and Longitudes 6°24'01.1"N 5°36'36.3"E ²⁷. It has an area of approximately 25 square Kilometres ²⁶

3.2 STUDY DESIGN

A descriptive cross-sectional study will be used.

3.3 DURATION OF STUDY

This study will be carried out from December 2024 to November 2025

3.4 STUDY POPULATION

Motorcycle and Tricycle riders in Ugbowo

3.4.1 Selection Criteria

3.4.11 Inclusion Criteria

All motorcycle and tricycle rides within the study area

Those who consent to participate in the study

3.4.12 Exclusion

Those who decline to participate in the study

3.5 SAMPLE SIZE DETERMINATION

The minimum sample size for this study will be calculated using the formula for single proportion²⁸

$$n = \frac{z^2 pq}{d^2}$$

Where:

n = minimum sample size

z = standard normal deviation set at 1.96 (at 95% confidence interval)

p = prevalence value [proportion of particular character in a study (Mesquita et al., 2017)]

q = 1.0 – p

d = degree of accuracy

Thus:

P = prevalence value = 19% = 0.19 [Proportion of the study population (elderly) in South-Western Nigeria that were edentulous (Olusile et al., 2015)]

q = 1.0 – p = 1 – 0.19 = 0.81

Substituting for the above equations

$$n = \frac{z^2 pq}{d^2}$$

$$n = \frac{(1.96)^2 \times 0.19 \times 0.81}{0.05^2}$$

$$n = 236$$

To make provisions for unreturned questionnaires, a non-response of 10% will be incorporated.

$$n_{rr} = \frac{10 \times 236}{100} = 24$$

$$n_f = n + n_{rr}$$

$$n_f = 24 + 236 = 260$$

3.6 SAMPLING TECHNIQUE

A simple random sampling technique will be used.

3.7 DATA COLLECTION

3.7.1 Method of Data Collection

A quantitative method of data collection will be used for this study.

3.7.2 Tools for Data Collection

Data collection will be achieved by the use of structured, interviewer-administered questionnaire. The questionnaire will consist of

SECTION A: Socio-Demographic Profile

SECTION B: Oral Health History

SECTION C: History of Trauma and other causes of Tooth Loss

SECTION D: Use of Protective Gear and Safety Practices

SECTION E: Knowledge and Attitude towards Oral Health

3.8 DATA MANAGEMENT AND PRESENTATION

This will involve the scoring system for responses, analysis and presentation of data

3.8.1 Scoring Systems

Data from the questionnaires will be coded and entered into SPSS IBM for analysis

3.8.2 Methods of Data Analysis

Data from the questionnaires will be analysed and coded using IBM Statistical Package for Scientific Solutions (SPSS) version 29.0

3.8.3 Data Presentation

The results will be presented as prose, frequency tables, bar charts and pie charts.

3.9 ETHICAL CONSIDERATION

Permission for this study will be obtained from the Edo State Research Ethics Committee, Ministry of Health and from the management of the health facilities used for this study. Verbal informed consent will be attained from the bicycle/motorcycle and tricycle riders who will participate in this study. Participants will be assured of confidentiality in the handling of volunteered information.

CHAPTER FOUR

RESULTS

A total of 260 respondents participated in the study and the response rate was 100%. The results are presented in the following sections in line with the specific objectives.

SECTION A: Sociodemographic characteristics of respondents

SECTION B: Oral health history

SECTION C: History of tooth loss and accidents

SECTION D: Use of protective gear and safety practices

SECTION E: Knowledge of oral health practices

SECTION F: Lifestyle and health behaviours

SECTION A

SOCIODEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Variables	Frequency (n = 260)	Percent
Age Group (years)		
18 – 25	71	27.3
26 – 35	105	40.4
36 – 45	48	18.5
> 45	36	13.8
Mean age $\pm$ SD	2.19 $\pm$ 0.99	
Sex		
Female	8	3.1
Male	252	96.9
Marital status		
Single	115	44.2
Cohabiting	6	2.3
Married	126	48.5
Separated	6	2.3
Divorced	5	1.9
Widowed	2	0.8
Recategorized marital status		
Ever married	139	53.5
Never married	121	46.5
Household size		
< 5	82	31.5
$\geq$ 5	178	68.5
Educational status		
No formal education	1	0.4
Primary	28	10.8
Secondary	151	58.1
Tertiary	80	30.8
Monthly income (₦)		
$\leq$ 60,000	66	25.4
60,0001 – 100,000	66	25.4
>100,000	128	49.2
Socioeconomic status		
Low	49	18.8
Middle	171	65.8
High	40	15.4

Table 1: Sociodemographic characteristics of respondents

Variables	Frequency (n = 260)	Percent
Vehicle type		
Bicycle	27	10.4
Motorcycle	47	18.1
Tricycle	186	71.5
Daily work duration (hours)		
< 4	18	6.9
4 – 8	50	19.2
9 – 12	77	29.6
> 12	115	44.2
Duration of work		
< 6 months	13	5.0
6 months – 2 years	91	35.0
3 – 5 years	112	43.1
> 5 years	44	16.9

Table 1: Sociodemographic characteristics of respondents continued.

SECTION B
ORAL HEALTH HISTORY

Table 2: Oral health history

Variables	Frequency (n = 260)	Percent
Location of nearest dental clinic		
Close	113	43.5
Far	76	29.2
Unaware	71	27.3
Frequency of dental visits		
Every 6 months	5	1.9
Once a year	9	3.5
Only when need arises	37	14.2
Never	209	80.4
Dental care received (n=51)		
Tooth cleaning	28	54.9
Denture/bridges	7	13.7
Root canal therapy	3	5.9
Extraction	13	25.5
Time of last dental visit (years) (n=51)		
≤ 1	22	43.1
1 – 3	16	31.4
> 3	13	25.5
Barriers to regular dental visits		
High cost	21	8.8
Time constraint	10	4.2
Fear of procedures	2	0.8
No dental clinic nearby	5	2.1
No indication	200	84.0
Oral health issue at present		
Yes	31	11.9
No	229	88.1
Oral health diagnosis (n=31)		
Toothache	19	61.3
Tooth discoloration	1	3.2
Hypersensitivity	2	6.5
Retained tooth	1	3.2
Impacted tooth	1	3.2
Hole in tooth	4	12.9
Bleeding gum	1	3.2
Gingivitis	2	6.5

SECTION C
HISTORY OF TOOTH LOSS AND ACCIDENTS

Table 3: History of tooth loss and accidents

Variables	Frequency (n = 260)	Percent
History of tooth loss		
Yes	32	12.3
No	228	87.7
Age at first tooth loss (years) (n=32)		
18 – 25	16	50.0
26 – 35	12	37.5
36 – 45	2	6.3
> 45	2	6.3
Number of teeth lost (n=32)		
1 – 3	27	84.4
4 – 6	5	15.6
Position of missing teeth (n=32)		
Front (upper)	22	68.8
Front (lower)	11	34.4
Back (upper)	9	28.1
Back (lower)	10	31.3
History of road traffic accident while riding		
Yes	88	33.8
No	172	66.2
Cause of accident (n=88)		
Bad road	22	25.0
Another driver's fault	45	51.1

Weather conditions	6	6.8
Speeding	7	8.0
Vehicle fault	8	9.1
Injury to mouth/teeth as a result (n=88)		
Yes	17	19.3
No	71	80.7
Type of injury sustained (n=17)		
Tooth knocked out	10	58.8
Tooth chipped/broken	2	11.8
Tooth loosened	2	11.8
Cuts/bruises to lips or gums	3	17.6
Severity of injury		
Mild	1	5.9
Moderate	10	58.8
Severe	6	35.3
Place of treatment		
Hospital	11	64.7
Pharmacy	4	23.5
Did not seek care	2	11.8

Variables	Frequency (n = 260)	Percent
Tooth loss to non-accidental cause		
Yes	33	12.7
No	227	87.3
Non-accidental causes (n=33)		
Sports injury	1	3.0
Physical fight/assault	12	36.4
Fall unrelated to riding	6	18.2
Previously loose	5	15.2
Hole	9	27.3
Risk of tooth loss increased by riding		
Yes	132	50.8
No	128	49.2

Table 3: History of tooth loss and accidents continued

	Edentulism		Test statistic	p-value
Variables	Yes (n=32)	No (n=228)	(χ^2)	
	Freq. (%)	Freq. (%)		
Age Group (years)				
18 – 25	8 (11.3)	63 (88.7)	$\chi^2 = 4.745$	0.186
26 – 35	9 (8.6)	96 (91.4)		
36 – 45	10 (20.8)	38 (79.2)		
> 45	5 (13.9)	31 (86.1)		
Sex				
Female	1 (12.5)	7 (87.5)	$\chi^2 = 0.000$	>0.999
Male	31 (12.3)	221 (87.7)		
Marital status				
Ever married	17 (12.2)	122 (87.8)	$\chi^2 = 0.002$	>0.999
Never married	15 (12.4)	106 (87.6)		
Socioeconomic status				
Low	6 (12.2)	43 (87.8)	$\chi^2 = 0.328$	0.852
Middle	20 (11.7)	151 (88.3)		
High	6 (15.0)	34 (85.0)		
Vehicle type				
Bicycle	6 (22.2)	21 (77.8)	$\chi^2 = 4.619$	0.104
Motorcycle	8 (17.0)	39 (83.0)		
Tricycle	18 (9.7)	168 (90.3)		
Duration of work				
< 6 months	3 (23.1)	10 (76.9)	$\chi^2 = 2.972$	0.397

6 mo. – 2 years	8 (8.8)	83 (91.2)		
3 – 5 years	14 (12.5)	98 (87.5)		
> 5 years	7 (15.9)	37 (84.1)		
Frequency of dental visits				
Every 6 months	2 (40.0)	3 (60.0)	17.443+	<0.001*
Once a year	0 (0.0)	9 (100.0)		
Only when need arises	12 (32.4)	25 (67.6)		
Never	18 (8.6)	191 (91.4)		
History of road traffic accident while riding				
Yes	16 (18.2)	72 (81.8)	$\chi^2 = 4.253$	0.047*
No	16 (9.3)	156 (90.7)		
Injury to mouth/teeth as a result of RTA				
Yes	10 (58.8)	7 (41.2)	23.395	<0.001*
No	6 (8.5)	65 (91.5)		
Helmet use				
Yes	9 (18.0)	41 (82.0)	$\chi^2 = 1.859$	0.228
No	23 (11.0)	187 (89.0)		

Table 4: Association between sociodemographic factors and edentulism

**Statistically significant; +Fisher's Exact Test*

Variables	Edentulism		Test statistic (χ^2)	p-value
	Yes (n=32)	No (n=228)		
	Freq. (%)	Freq. (%)		
Smoking				
Yes	11 (17.7)	51 (82.3)	$\chi^2 = 2.228$	0.182
No	21 (10.6)	177 (89.4)		
Consume alcohol				
Yes	18 (14.6)	105 (85.4)	$\chi^2 = 1.171$	0.345
No	14 (10.2)	123 (89.8)		
Sugary foods/drink intake				
Yes	24 (12.2)	173 (87.8)	$\chi^2 = 0.012$	>0.999
No	8 (12.7)	55 (87.3)		
History of a chronic medical condition				
Yes	4 (11.8)	30 (88.2)	0.011+	>0.999
No	28 (12.4)	198 (87.6)		
Road safety training				
Yes	11 (10.2)	97 (89.8)	$\chi^2 = 0.771$	0.446
No	21 (13.8)	131 (86.2)		
Knowledge of oral health				
Good	25 (13.1)	166 (86.9)	$\chi^2 = 0.407$	0.670
Poor	7 (10.1)	62 (89.9)		

Table 4: Association between sociodemographic factors and edentulism continued

**Statistically significant; +Fisher's Exact Test*

SECTION D
USE OF PROTECTIVE GEAR AND SAFETY PRACTICES

Table 4: Use of protective gear and safety practices

Variables	Frequency (n = 260)	Percent
Helmet use while riding		
Always	20	7.7
Most of the time	9	3.5
Sometimes	8	3.1
Rarely	13	5.0
Never	210	80.8
Reason for not using helmet		
Too expensive	12	5.7
Uncomfortable	11	5.2
Not required by law	24	11.4
Not needed	163	77.6
Helmet gotten...(n=50)		
Provided by employer	10	20.0
Borrowed	6	12.0
Shared	2	4.0
Purchased by self	32	64.0
Type of helmet (n=50)		
Full-face	21	42.0
Open-face	15	30.0
Half	7	14.0
Don't know	7	14.0
Proper use of helmet (n=50)		
Yes	44	88.0

No	6	12.0
How often helmet is replaced (n=50)		
Every 1 – 2 years	4	8.0
Every 3 – 5 years	2	4.0
Only when damaged	19	38.0
Never	25	50.0
Helmet use protects teeth during accidents		
Yes	138	53.1
No	122	46.9
Received road safety training		
Yes	108	41.5
No	152	58.5

SECTION E
KNOWLEDGE AND ATTITUDE TOWARDS ORAL HEALTH

Table 5: Knowledge of oral health practices

Variables	Frequency (n = 260)	Percent
Frequency of teeth cleaning		
Twice a day or more	195	75.0
Once a day	31	11.9
Every 2 – 3 days	24	9.2
Less than once a week	8	3.1
Never	2	0.8
Teeth cleaning agent*		
Toothbrush and toothpaste	251	86.0
Chewing stick	20	6.8
Mouthwash	5	1.7
Dental floss	7	2.4
Salt/charcoal	6	2.1
Dental powder	3	1.0
Poor oral hygiene can lead to tooth loss		
Yes	200	76.9
No	60	23.1
Dental injuries from accidents can be treated if acted on quickly		
Yes	184	70.8
No	76	29.2
Importance of dental check-ups		
Very important	133	51.2
Somewhat important	88	33.8

Not important	20	7.7
Not sure	19	7.3
Confidence in knowledge of oral health		
Very confident	81	31.2
Somewhat confident	107	41.2
Not confident	48	18.5
Not sure	24	9.2

**Multiple response question*

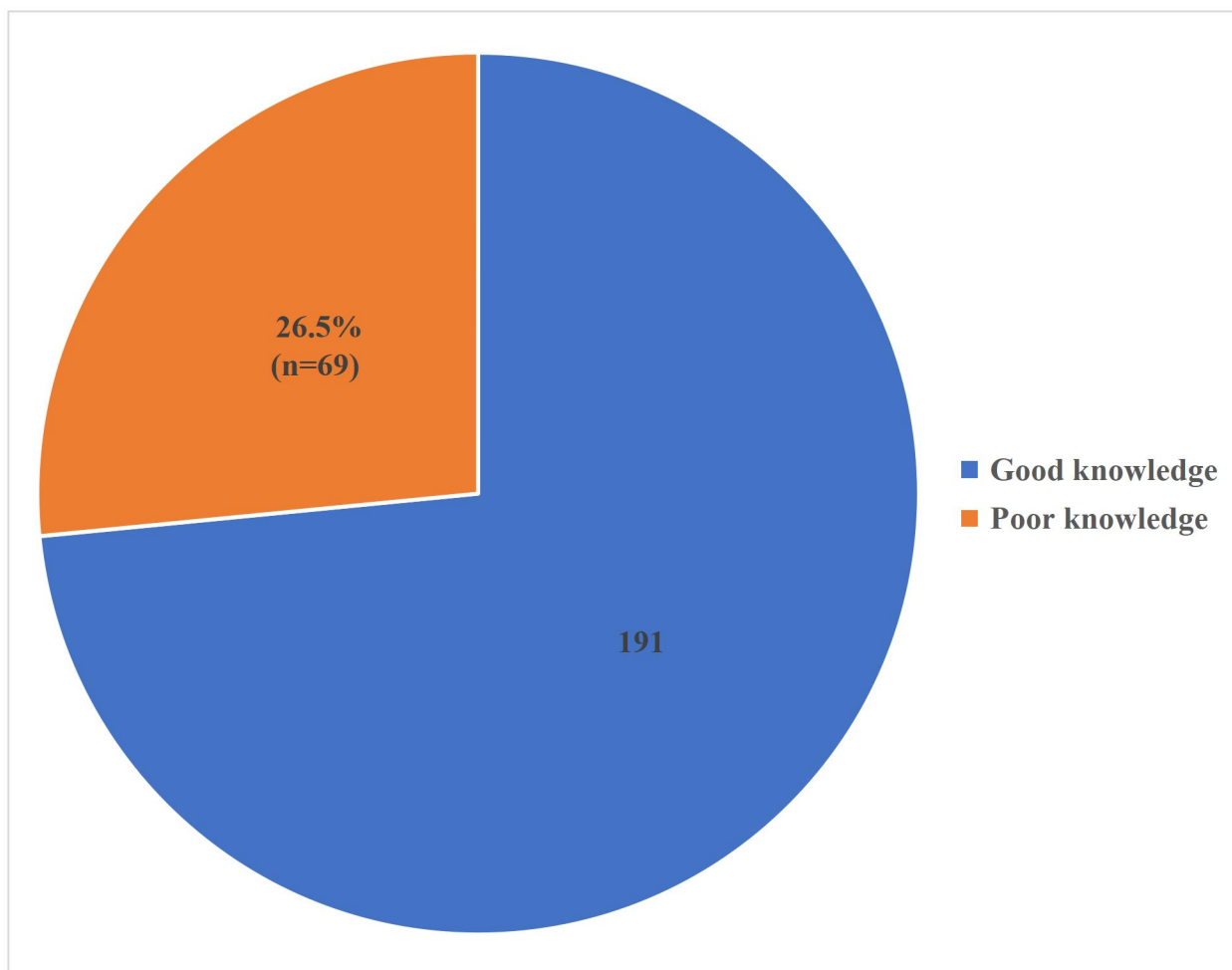


Figure 1: Knowledge of oral health practices among respondents.

SECTION F
LIFESTYLE AND HEALTH BEHAVIOURS

Table 6: Lifestyle and health behaviours

Variables	Frequency (n = 260)	Percent
Smoking		
Yes	62	23.8
No	198	76.2
Frequency of smoking (n=62)		
Multiple times a day	39	62.9
Once a day	11	17.7
Few times a week	10	16.1
Rarely	2	3.2
Alcohol use		
Yes	123	47.3
No	137	52.7
Frequency of alcohol consumption (n=123)		
Daily	35	28.5
2 – 3 times a week	22	17.9
Once a week	15	12.2
Occasionally	51	41.5
Quantity of alcohol consumed (n=123)		
1 – 2 drinks	103	83.7
3 – 5 drinks	16	13.0
> 5 drinks	4	3.3
History of a chronic medical condition		
Yes	34	13.1
No	226	86.9

Condition (n=34)

Diabetes	6	17.6
Hypertension	12	35.3
Peptic ulcer disease	9	26.5
Myopia	2	5.9
Other*	5	14.7

Sugary foods/drink intake

Multiple times a day	63	24.2
Once a day	57	21.9
Few times a week	77	29.6
Rarely/never	63	24.2

Overall health rating

Excellent	102	39.2
Good	143	55.0
Fair	15	5.8

****Others: Glaucoma, HBV infection, Pneumonia, Rhinitis and Skin infection.***

CHAPTER FIVE

DISCUSSION

The findings from this study provide important insights into the causes of edentulism among bike and tricycle riders, highlighting the combined influence of accidental trauma and poor oral health. Among the 260 respondents, 12.3% (32 individuals) reported a history of tooth loss, indicating a notable burden within this population. Accidental causes, particularly road traffic accidents, contributed significantly, as 10 respondents explicitly reported that a tooth was knocked out due to a crash. However, non-accidental causes were also prominent among the 33 respondents who reported tooth loss from non-vehicular causes, with physical fights or assaults accounting for 36.4%, followed by severe dental caries (“hole” in the tooth) at 27.3%, falls unrelated to riding at 18.2%, and previously loosened teeth at 15.2%. The study showed that physical fights (36.4%) is a leading non-accidental cause. While previous research work, focused heavily on periodontal disease and tobacco use as the silent drivers of edentulism (Ojehanon & Akhionbare, 2006), this research highlights a social-behavioural component (assault/fights) that is frequently omitted in clinical dental literature but is highly relevant to the occupational sociology of commercial riders in Benin. These findings suggest that while occupational hazards are important, underlying oral health conditions and interpersonal violence also play substantial roles in tooth loss.

The analysis further demonstrates a strong and statistically significant association between road traffic accidents and dental trauma. Overall, 33.8% of respondents reported having experienced a road traffic accident while riding, and among these 88 individuals, 19.3% sustained injuries to their mouth or teeth. The finding that 19.3% of riders sustained direct mouth injuries during accidents mirrors the study done in Ugbowo, Benin city, which

identifies road traffic accidents (RTA) as the primary driver of maxillofacial trauma in Ugbowo (Omeje et al. 2007). The severity of these injuries was considerable, as 58.8% of those with oral injuries had a tooth completely knocked out, while 11.8% experienced chipped or broken teeth and another 11.8% reported loosened teeth. In addition, 58.8% of these injuries were classified as moderate and 35.3% as severe, highlighting the destructive impact of such incidents on dentition. Statistical analysis confirmed that experiencing a road traffic accident while riding is significantly associated with edentulism ($p = 0.047$), and sustaining an injury to the mouth or teeth during an accident is even more strongly correlated with tooth loss ($p < 0.001$). This underscores trauma as a major etiological factor in edentulism among this group.

Despite the high risk of injury, the use of protective gear among respondents was notably low, which complicates the assessment of its effectiveness. An overwhelming 80.8% of riders reported that they never use a helmet while riding, whereas only 7.7% indicated that they always wear one. The primary reason for non-use was the perception that helmets are “not needed,” as reported by 77.6% of respondents, while 11.4% stated that helmet use is “not required by law.” This perception of helmets not needed was significantly seen among tricycle riders. Among the 50 individuals who reported using helmets, only 42.0% used full-face helmets, while others relied on open-face (30.0%) or half helmets (14.0%), which provide limited protection for the maxillofacial region. Interestingly, cross-tabulation showed that helmet use did not have a statistically significant association with preventing edentulism in this population ($p = 0.228$). However, this finding is likely influenced by the small number of helmet users and the predominance of helmet types that do not adequately protect the teeth and jaws, thereby limiting the observable protective effect.

Based on these findings, several preventive measures are recommended. There is a need for targeted safety education, particularly as 77.6% of non-users believe that helmets are unnecessary, indicating a significant gap in risk perception. Behavioural change campaigns should therefore emphasize the direct relationship between riding and the risk of severe dental trauma. Although, it's not customary for tricycle riders to wear helmet, they need to have a major paradigm shift to embrace it. In addition, there is a strong case for enforcing mandatory use of full-face helmets, given that most of the helmets currently used by riders are open-face or half helmets, which offer inadequate protection. Furthermore, manufacturers of tricycles can incorporate seat belts as a protective gear for tricycle riders. Improving dental care-seeking behaviour is also essential, as 80.4% of respondents reported never visiting a dentist and 84.0% indicated that they saw no reason to do so. Encouraging routine dental visits would help address preventable causes of tooth loss such as dental caries before they progress to the point of extraction. Finally, strengthening defensive driving training is important, especially since only 41.5% of respondents have received road safety training, while 51.1% of accidents were attributed to another driver's fault and 25.0% to bad road conditions. Enhancing riders' defensive driving skills could reduce the incidence of accidents and, consequently, trauma-related tooth loss.

CONCLUSION

This study highlights that edentulism is a notable burden among motorcycle and tricycle riders in Ugbowo, affecting 12.3% of the surveyed population. The prevalence of tooth loss in this demographic is driven by a combination of accidental trauma, specifically road traffic accidents, as well as non-accidental factors like physical assaults, falls, and severe dental caries. There is a strong and statistically significant correlation between experiencing a road traffic accident while riding and edentulism, particularly when injuries to the mouth or teeth are sustained. Despite facing these elevated occupational risks, 80.8% of riders never use a helmet, primarily driven by the perception that such protective gear is unnecessary. Furthermore, poor dental care-seeking behaviours significantly exacerbate the issue, with 80.4% of respondents reporting that they never visit a dentist. Ultimately, both occupational hazards and underlying social and behavioural factors play substantial roles in the tooth loss observed in this population

RECOMMENDATION

Based on the research findings, it is recommended to implement targeted behavioural change campaigns that emphasize the direct relationship between riding and the risk of severe dental trauma, enforce the mandatory use of full-face helmets since currently used options offer inadequate protection, encourage tricycle manufacturers to incorporate seat belts as standard protective gear, develop community initiatives that promote routine dental care to address preventable causes of tooth loss like dental caries, and strengthen access to defensive driving training to reduce the incidence of accidents and subsequent trauma-related tooth loss.

REFERENCES

1. Petersen PE. The World Oral Health Report 2003: Continuous Improvement of Oral Health in the 21st Century – The Approach of the WHO Global Oral Health Programme. *Community Dentistry and Oral Epidemiology*. 2003;31(s1):3–24.
2. Akpata ES, Akpata OI, Ayanbadejo PO. Oral Health in Nigeria: A Country Profile. *Int Dent J*. 2003;53(5):299–304.
3. Ayo-Yusuf OA, Olusile AO, Ayo-Yusuf IA. Oral Health in Sub-Saharan Africa: Current Situation and Future Directions. *Afr J Oral Health*. 2011;28(2):115–21.
4. Olusile AO, Adekeye OA. Prevalence and Pattern of Edentulism Among Older Adults in Nigeria. *J Dent Res*. 2015;92(3):345–50.
5. Wegman F, Zhang F, Dijkstra A. Safety Effects of Road Design and Traffic Management on Vulnerable Road Users. *Transp Res Part A Policy Pract*. 2012;46(4):613–26. doi: 10.1016/j.tra.2012.01.001.
6. Huang Y. Bicyclist Injury Risk and Road Safety Measures: A Systematic Review. *Accid Anal Prev*. 2020;135:105376. doi: 10.1016/j.aap.2020.105376.
7. Mesquita GC, Soares PBF, Moura CCG, Roscoe MG, Paiva SM, Soares CJ. A 12-Year Retrospective Study of Avulsion Cases in a Public Brazilian Dental Trauma Service. *Braz Dent J*. 2017;28(6):749–56. doi: 10.1590/0103-6440201701610.
8. Zibung E, Mang L, Schrader D, Schmeling A, Peschel O. Head and Facial Injuries in Cyclists with Helmet Use: An Observational Study. *J Forensic Leg Med*. 2015;33:52–7.
9. Boffano P, Kommers SC, Karagozoglu KH, Forouzanfar T. Bicycle-Related Maxillofacial Fractures: A Systematic Review. *J Oral Maxillofac Surg*. 2013;71(2):301–9. doi: 10.1016/j.joms.2012.03.020.

10. Bacchieri G, Barros AJ, Victora CG. Effectiveness of Bicycle Helmet Legislation in Preventing Bicycle-Related Injuries. *Accid Anal Prev*. 2005;37(4):654–8.
11. Andreasen JO, Andreasen FM, Andersson L. Textbook and Color Atlas of Traumatic Injuries to the Teeth. 4th ed. Wiley-Blackwell; 2007.
12. Sanabe SM, Cavalcante LB, Coldebella CR, De Abreu e Lima FCB. Dental Traumatism Urgencies: Classification, Signs, and Procedures. *Rev Paul Pediatr*. 2009;27(4):447–51. doi: 10.1590/S0103-05822009000400015.
13. Çulha E, Tunç F. Türkiye’de Bisiklet Sporcularının Dental Travma Bilgi Düzeylerinin Değerlendirilmesi. *Selcuk Dent J*. 2023;10(2):401–5. doi: 10.15311/selcukdentj.1140884.
14. Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bull World Health Organ*. 2010;83(9):661–9.
15. Ayo-Yusuf OA, Ayo-Yusuf IJ, Olutola BG. Sociodemographic correlates of edentulism and inadequate dentition among South African adults. *BMC Oral Health*. 2011;11(1):4.
16. Olusile AO, Akande OO, Oginni AO, Oginni FO. Periodontal status of elderly in a semi-urban community in Nigeria. *Afr Health Sci*. 2015;15(2):480–6.
17. Akpata ES, Otoh EC, Otoh RC. Tooth loss, edentulism and challenges of provision of prostheses in Nigeria. *Int Dent J*. 2003;53(6):385–92.
18. Boffano P, Kommers SC, Karagozoglu KH, Forouzanfar T. Bicycle-related maxillofacial injuries: a retrospective study. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2013;116(4):e283–8.
19. Mesquita RA, Passeri LA, Alencar FGP Jr. Prevalence and characteristics of dental trauma in Brazilian athletes. *Dent Traumatol*. 2017;33(5):361–6.
20. Bacchieri G, Barros AJ. Cycling and health: a systematic review of evidence. *Cad Saude Publica*. 2005;21(6):1937–49.

21. Culha G, Aras MH, Karabekiroglu I, Arslan M, Topkaya S. Risk factors for dental trauma in motorcycle riders in Turkey. *Int Dent J*. 2023;73(4):285–92.
22. Andreasen JO, Lauridsen E, Gerds TA, Ahrensburg SS. Dental injuries and survival of replanted teeth. *Dent Traumatol*. 2007;23(3):145–55.
23. Sanabe ME, Ueno M, Zaitse T, Kawaguchi Y. Factors influencing outcomes of dental trauma: systematic review. *Dent Traumatol*. 2009;25(6):535–9.
24. Petersen PE, Ogawa H. Strengthening the prevention of periodontal disease: the WHO approach. *J Periodontol*. 2010;81(12):1485–92.
25. Encyclopedia Britannica. Benin City. Encyclopedia Britannica; 2013. Available from: <https://surl.li/eeawkwo>
26. Geological Survey Agency. Geological map of Edo State showing Benin City and other locations [Internet]. ResearchGate. [cited 2023]. Available from: <https://surl.li/eeawkwo>
27. Google Maps. Benin City, Edo State, Nigeria: Geography and urban development [Internet]. [cited 2023]. Available from: <https://www.google.com/maps>
28. W. Sampling Techniques. 3rd ed. New York: John Wiley & Sons; 1977.
29. Omeje, K. U., Efunkoya, A. A., & Akpata, O. (2007). Maxillofacial trauma due to road traffic accidents in Benin City, Nigeria. *West African Journal of Medicine*, 26(4): <https://www.ajol.info/index.php/wajm/article/view/28312>
30. Ojehanon, P. I., & Akhionbare, O. (2006). Periodontal issues, tooth loss, and oral hygiene measures among tobacco-using drivers in Benin City. *Journal of Medicine and Biomedical Research*, 5(1), 33–39. <https://www.researchgate.net/publication/288206446>

APPENDIX

QUESTIONNAIRE

PREVALENCE OF EDENTULISM AMONG MOTORCYCLE/BICYCLE AND TRICYCLE RIDERS IN UGBOWO

Dear Respondent,

We are 600-level Dental students at the University of Benin conducting a study on the prevalence of edentulism among motorcycle, bicycle, and tricycle riders in Ugbowo, Benin City. The findings will help improve oral health awareness and inform relevant health policies. Please respond truthfully and to the best of your ability. All responses will be kept confidential and used solely for research purposes.

SECTION A: SOCIO-DEMOGRAPHIC PROFILE

1. Age (at last birthday)

☐ 18-25 years | ☐ 26-35 years | ☐ 36-45 years | ☐ 46-55 years | ☐ Above 55 years

2. What is your gender?

☐ Male | ☐ Female

3. What is your marital status?

☐ Married | ☐ Single | ☐ Living with a partner | ☐ Divorced/Separated | ☐ Widowed

4. How many in your household? _____

5. Highest level of education?

☐ No formal education | ☐ Primary School | ☐ Secondary School | ☐ Tertiary Education |

☐ Vocational training

6. Average monthly income?

☐ Below 10,000 | ☐ 10,000-30,000 | ☐ 31,000-60,000 | ☐ 61,000-100,000 | ☐ Above
100,000

7. What do you ride?

☐ Bicycle | ☐ Motorcycle | ☐ Tricycle

8. How many hours do you ride daily?

☐ < 4 hours | ☐ 4-8 hours | ☐ 9-12 hours | ☐ > 12 hours

9. How long have you been riding?

☐ < 6 months | ☐ 6-2 years | ☐ 3-5 years | ☐ > 10 years

10. How far is the nearest dental clinic from your residence? _____

SECTION B: ORAL HEALTH HISTORY

To assess participants oral health status, dental care utilization, and barriers to care.

11. How often do you visit a dentist?

☐ Every 6 months | ☐ Once a year | ☐ Every 2-3 years | ☐ Only when I have a problem |

☐ Never (If never, skip to question 14)

12. What type of dental treatment have you received? (select all that apply)

☐ Tooth cleaning | ☐ Denture or bridges | ☐ Root Canal treatment | ☐ Extraction | ☐

Others

13. When was your last dental visit?

☐ 6-12 months ago | ☐ 1-3 years ago | ☐ More than 3 years ago | ☐ Never

14. If you do not visit a dentist regularly? What prevents you? (select all that apply)

☐ No dental problems | ☐ High cost | ☐ No time | ☐ Fear of pain of procedures | ☐ No dental clinic nearby | ☐ Don't trust dentist | ☐ Other: _____

15. Do you currently have any oral health issues? (If yes, state which) * _____

SECTION C: HISTORY

Explore the role of accidents and other factors in tooth loss

16. Have you lost any natural teeth? (not to extraction and excluding wisdom teeth)

☐ Yes | ☐ No (If no, skip to question 20)

17. At what age did you first lose a tooth?

☐ 18-25 years | ☐ 26-35 years | ☐ 36-45 years | ☐ Above 45 years

18. If yes, how many? *

☐ 1-3 | ☐ 4-6 | ☐ 7-10 | ☐ > 10 | ☐ All teeth

19. Where are the missing teeth?

☐ Front teeth (upper) | ☐ Front teeth (lower) | ☐ Back teeth (upper) | ☐ Back teeth (lower)

20. Have you ever been involved in a road accident while riding a motorcycle, tricycle or bicycle?

☐ Yes | ☐ No (If no, skip to 31)

21. What was the cause of the accident?

☐ Bad roads | ☐ Other drivers' fault | ☐ Weather condition | ☐ Speeding | ☐ Vehicle fault |

☐ Other: _____

22. Did the accident cause injury to your mouth or teeth?

☐ Yes | ☐ No (If no, skip to 25)

23. What type of injury occurred? (select all that apply)

☐ Tooth knocked out | ☐ Tooth chipped or broken | ☐ Tooth loosened (tooth shaking) | ☐

Jaw injury | ☐ Cuts or bruises to lips/gums | ☐ Other: _____

24. How severe was the injury to your teeth or mouth?

☐ Mild (e.g., minor chip) | ☐ Moderate (e.g., tooth loosened) | ☐ Severe (e.g., tooth lost or jaw broken)

25. What did you do immediately after the injury?

☐ Visited a dentist | ☐ Visited a hospital | ☐ Visited a pharmacist | ☐ Did nothing | ☐

Other: _____

26. Have you lost teeth due to causes other than accidents? *

☐ No | ☐ Yes (If no, skip to 27)

27. Have you ever experienced tooth loss from other incidents? (Select all that apply)

☐ Sports injury | ☐ Physical fight/assault | ☐ Fall unrelated to riding | ☐ Tooth was shaking
then fell off | ☐ Tooth had hole then fell off

28. Do you think that riding increases your risk of tooth loss?

☐ Yes | ☐ No | ☐ Not sure

SECTION D: USE OF PROTECTIVE GEAR AND SAFETY PRACTICES

To evaluate the adoption and perception of safety measures.

29. Do you wear a helmet while riding? *

☐ Always | ☐ Most of the time | ☐ Sometimes | ☐ Rarely | ☐ Never

30. What type of helmet do you use?

☐ Full-face helmet | ☐ Open-face helmet | ☐ Half helmet | ☐ Don't know

31. How did you get your helmet?

☐ Provided by employer | ☐ Borrowed or shared | ☐ Purchased it myself | ☐ Other: _____

32. Do you know how to use a helmet?

☐ Yes | ☐ No

33. How often do you replace your helmet?

☐ Every 1-2 years | ☐ Every 3-5 years | ☐ Only when damaged | ☐ Never replaced

34. If you don't wear a helmet, why not? (Select all that apply)

☐ Too expensive | ☐ Not comfortable | ☐ Not required by law | ☐ I don't need it | ☐ Other:

35. Do you think helmets protect your teeth during accidents?

☐ Yes | ☐ No | ☐ Not sure

36. Have you ever received training on road safety?

☐ Yes | ☐ No

SECTION E: KNOWLEDGE AND ATTITUDE TOWARDS ORAL HEALTH

To assess awareness, practices, and willingness to improve oral health.

37. How often do you clean your teeth?

☐ Twice a day or more | ☐ Once a day | ☐ Every 2-3 days | ☐ Less than once a week | ☐

Never

38. What do you use to clean your teeth? (Select all that apply)

☐ Toothbrush and toothpaste | ☐ Chewing stick | ☐ Mouthwash | ☐ Dental floss | ☐ Salt or charcoal | ☐ Dental powder | ☐ Nothing

39. Do you know that poor oral hygiene can lead to tooth loss?

☐ Yes | ☐ No

40. Do you know that dental injuries from accidents can be treated if taken care of quickly?

☐ Yes | ☐ No

41. How important do you think dental check-ups are?

☐ Very important | ☐ Somewhat important | ☐ Not important | ☐ Not sure

42. How confident are you in your knowledge of oral health?

☐ Very confident | ☐ Somewhat confident | ☐ Not confident | ☐ Not sure

SECTION F: LIFESTYLE AND HEALTH BEHAVIORS

To capture lifestyle factors that may affect oral health

43. Do you smoke (tobacco, shisha, tobacco)?

☐ Yes | ☐ No (If no, skip to 45)

44. How often do you smoke?

☐ Multiple times a day | ☐ Once a day | ☐ Few times a week | ☐ Rarely

45. Do you consume alcohol (beer, spirit, etc)

☐ Yes | ☐ If no, skip to

46. If yes, how often do you drink alcohol?

☐ Daily | ☐ 2-3 times a week | ☐ Once a week | ☐ Occasionally

47. Do you have any medical conditions?

☐ No | ☐ Yes

48. If yes, which?

☐ Diabetes | ☐ Hypertension | ☐ HIV | ☐ Other: _____

49. How much alcohol do you typically consume at once?

☐ 1-2 drinks | ☐ 3-5 drinks | ☐ More than 5 drinks

50. How often do you eat sugary foods or drinks (e.g., soda, sweets, cakes)?

☐ Multiple times a day | ☐ Once a day | ☐ Few times a week | ☐ Rarely or never

51. How would you rate your overall health?

☐ Excellent | ☐ Good | ☐ Fair | ☐ Poor