REPUBLIQUE DU CAMEROUN
Paix-Travail-patrie

UNIVERSITE DE YAOUNDE I

FACULTE DE MEDECINE ET DES SCIENCES BIOMEDICALES

REPUBLIC OF CAMEROON
Peace-Work-Fatherland

UNIVERSITY OF YAOUNDE I

FACULTY OF MEDICINE AND BIOMEDICAL SCIENCES

DEPARTMENT OF PEDIATRICS

PEDIATRICIANS' KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS PARAFUNCTIONAL ORAL HABITS AND DENTAL MALOCCLUSIONS IN CHILDREN

Thesis presented and publicly defended in view of obtaining a doctorate in dental medicine

by

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Lecturer, Pediatric Dentistry

Academic year: 2023 -2024

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DEDICATION

This work is dedicated to my parents;

Mr. Awa Eric Fonkam and Mrs Awa Melvis Ngwi.

ACKNOWLEDGEMENT

I wish to extend my sincere and heart felt gratitude to:

GOD Almighty, for His presence in my life as well as the grace, strength, and favor He gave me throughout my medical training and the period of this work.

Pr. KOKI Ndombo Paul, the supervisor of this research work. You are an admirable professor and researcher, an epitome of knowledge and a source of inspiration and encouragement. It was an honour working with you.

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My siblings, Awa Eric Angelo, Awa Praise, Awa Daizy, Awa Mark-Shalom and Afanyu Divine Favour for their love for me and for being my source of inspiration.

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My grandmum, Mrs Naah Rebecca- your ageless strength and wisdom constantly inspire me.

My entire family for always being there for me. For all the prayers, encouragement, trust, I am grateful.

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The entire BBC Family for your support, mentorship, and encouragements.

The 49th batch of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé 1, it has been a great experience.

THE ADMINISTRATIVE AND TEACHING STAFF

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178	OKOMO ASSOUMOU Marie Claire	P	Bacteriology/ Virology
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259	MINYEM NGOMBI Aude Périne Epse AFUH	L	Pharmaceutical Regulation

KEY:

HD= Head of Department

P= Professor

AP= Associate Professor

SL= Senior Lecturer

L= Lecturer

THE PHYSICIAN'S OATH

Association in Geneva, Switzerland, September 1948
and amended by the 22nd World Medical Assembly, Sydney,
Australia (August 1968).

I will practice my profession with conscience and dignity;

The health of my patients was my first consideration;

I will respect secrets confided in me, even after the patient has died;

I will maintain by all the means in my power the honor and noble traditions of the medical profession;

My colleagues was my brothers and sisters;

I will not permit considerations of religion, nationality, race, political party or social standing to intervene between my duty and my patient;

I will maintain the utmost respect for human life from the time of conception, even under threat I will not use my medical knowledge contrary to the laws of humanity; I make these promises solemnly, freely and upon my honor.

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LIST OF ABREVIATIONS

W.H.O	World Health Organisation
O.M.S	Organisation Mondial de la Sante
AAP	American Academy of Pediatrics

ABSTRACT

Introduction. The World Health Organization (WHO) considers malocclusion as one of the most important oral health problems, after caries and periodontal disease. Its prevalence is highly variable and is estimated to be between 39% and 93% in children and adolescents. Parafunctional habits are abnormal hyperactive functions conducted by the masticatory structures, i.e. tongue, teeth, oral muscles, and so on. They include thumb sucking, tongue thrusting, bruxism, prolonged use of feeding bottle or pacifier and so on. Parafunctional habits happen to be a major risk factor for malocclusion. Adequate knowledge of pediatricians and their collaboration with oral healthcare providers would go a long way into sensitizing patients on parafunctional habits and their effect on the developing dentition, as well as intercepting malocclusions at an early stage where they can be corrected through referrals to orthodontists or pediatric dentists

Objective. Our objective was to evaluate the knowledge, attitude and practice of paediatricians in Cameroon towards parafunctional oral habits and dental malocclusions in children.

Materials and Methods. A descriptive, cross-sectional survey was sent to a sample of pediatricians in Cameroon. The questionnaire consisted of 35 questions in four domains; socioprofessional information, knowledge, attitude and practice.

Results. A total of 86 pediatricians participated in the survey. In terms of knowledge, 43% of respondents reported having knowledge that children with parafunctional oral habits are more likely to develop malocclusion. Regarding their attitude, 97.7% of respondents had a good attitude towards the subject. In terms of examination of the oral cavity, a low frequency of examination amongst pediatricians for malocclusion (10.5%) and oral functional habits (76.7%) was detected. 47.7% recommend oral health examinations only if there is a problem and 53.5% refer patients to a pediatric dentists when they notice any abnormality.

Conclusion. Although a vast majority of the paediatricians in our survey recognised their place in identifying and preventing parafunctions and malocclusions, very few have adequate knowledge and skills to perform evaluations and referrals.

Key words: Pediatricians, knowledge, attitude, practice, parafunctions, malocclusion

RÉSUMÉ

Introduction. L'Organisation Mondiale de la Santé (OMS) considère la malocclusion comme l'un des problèmes de santé bucco-dentaire les plus importants, après les caries et les maladies parodontales. Sa prévalence est très variable et est estimée entre 39 % et 93 % chez les enfants et adolescents. Les habitudes parafonctionnelles sont des fonctions hyperactives anormales exercées par les structures masticatoires, c'est-à-dire la langue, les dents, les muscles buccaux, etc. Ils comprennent la succion du pouce et de la langue, le bruxisme, l'utilisation prolongée d'un biberon ou d'une tétine, rongement des ongles etc. Les habitudes parafonctionnelles s'avèrent être un facteur de risque majeur de malocclusion. Une connaissance adéquate des pédiatres et leur collaboration avec les prestataires de soins bucco-dentaires contribueraient grandement à sensibiliser les patients aux habitudes parafonctionnelles et à leurs effets sur le développement de la dentition, ainsi qu'à intercepter les malocclusions à un stade précoce où elles peuvent être corrigées en les référant à des orthodontistes ou des pédodontistes

Objectif. Notre objectif était d'évaluer les connaissances, l'attitude et la pratique des pédiatres au Cameroun face aux habitudes bucco-dentaires parafonctionnelles et aux malocclusions dentaires chez l'enfant.

Matériels et méthodes. Une enquête descriptive et transversale a été envoyée à un échantillon de pédiatres au Cameroun. Le questionnaire comprenait 35 questions dans quatre domaines ; informations socioprofessionnelles, connaissances, attitudes et pratiques.

Résultats. Au total, 86 pédiatres ont participé à l'enquête. En termes de connaissances, 43 % des personnes interrogées ont déclaré savoir que les enfants ayant des habitudes buccales parafonctionnelles sont plus susceptibles de développer une malocclusion. Concernant leur attitude, 97,7% des répondants avaient une bonne attitude envers le sujet. En termes d'examen de la cavité buccale, une faible fréquence d'examens chez les pédiatres pour les malocclusions (10,5%) et les habitudes fonctionnelles buccales a été détectée. 47,7 % recommandent des examens de santé buccodentaire uniquement en cas de problème et 53,5% orientent les patients vers un dentiste pédiatrique lorsqu'ils constatent une anomalie.

Conclusion. Bien qu'une grande majorité des pédiatres de notre enquête reconnaissent leur place dans l'identification et la prévention des parafonctions et des malocclusions, très peu possèdent les connaissances et les compétences adéquates pour effectuer des évaluations et des références.

Mots clés : Pédiatres, connaissances, attitude, pratiques, parafonctions, malocclusion

CHAPTER I: INTRODUCTION

I.1 BACKGROUND

A habit is a practice acquired by the frequent repetition of the same act, which occurs consciously at first, then unconsciously [1]. Nasal breathing, chewing and swallowing are considered physiological and functional habits. However, digital sucking, pacifier sucking, tongue-thrusting, nail-biting, lip-biting and mouth breathing, amongst others, are considered non-physiological, and therefore, deleterious or parafunctional habits [1]. Studies have shown that while parafunctional habits can interfere with the position of the teeth and normal pattern of skeletal growth causing malocclusion, the negative influence of parafunctional habits on occlusion originates in childhood. Bottle feeding and non-nutritive sucking habits have been associated with malocclusions starting from the primary dentition. Several authors have pointed out that non-nutritive sucking habits are associated with an atypical swallowing pattern, and with tongue thrusting, which may be related to the development of malocclusions such as posterior crossbites [2]. A study carried out in Cameroon by Kalla *et al*. in 2022 showed an increasing prevalence of parafunctional oral habits in children [3].

The World Health Organization (WHO) considers malocclusion one of the most important oral health problems, after caries and periodontal disease. Its prevalence is highly variable and is estimated to be between 39% and 93% in children and adolescents [4]. In the same light, malocclusions have been noted to be of huge impact on children increasing their risk of dental caries, periodontal disease, increased possible temporomandibular disease, and increased risk of trauma and equally affecting their appearance, feeding habits and even their self- esteem.

Pediatricians usually are the first healthcare providers children visit and are most likely to examine patients earlier than pediatric dentists. However, very few patients present before pediatric dentists and orthodontists with referrals from pediatricians for parafunctional habits and malocclusions [5]. In a study published by Kumar *et al.* in India showed that most pediatricians were unaware that oral habits could be responsible for malocclusion [1]. The early identification and treatment of orthodontic abnormalities in the deciduous and early mixed dentition can prevent the development of significant anomalies in late mixed and permanent dentition, as well as reduce or even eliminate the need for subsequent orthodontic treatment.

I.2 JUSTIFICATION

Adequate knowledge of pediatricians on parafunctional habits and their collaboration with oral healthcare providers would go a long way in sensitizing patients and their care-givers on the long term effects of parafunctional habits on the developing dentition. Furthermore, identifying malocclusions at an early stage is essential in intercepting and correcting them through referrals to orthodontists or pediatric dentists. This study will therefore contribute to the available body of literature on this subject. It will equally raise an awareness on the role of pediatricians' in identifying and intercepting parafunctional oral habits and malocclusions. Lastly, this study will contribute to developing policy around early and widespread detection of malocclusion.

I.3 RESEARCH QUESTION

Do pediatricians have adequate knowledge, attitudes and practices towards parafunctional oral habits and dental malocclusions in children?

I.4 OBJECTIVES

I.4.i GENERAL OBJECTIVE

To assess pediatricians' knowledge, attitudes and practices towards parafunctional habits and malocclusions in children.

I.4.ii SPECIFIC OBJECTIVES

1-To assess pediatricians' knowledge of parafunctional habits and malocclusions as well as their understanding of the relationship between the two.

2-To describe pediatricians' attitude towards parafunctional habits and malocclusions.

3-To identify pediatricians' practices towards parafunctional habits and malocclusions.

CHAPTER II: LITERATURE REVIEW

Our literature review will cover the anatomy of the oral cavity, craniofcacial growth and development, tooth development, parafunctional habits and malocclusions. We will conclude with a review of existing literature on the subject.

II.1 THE ORAL CAVITY

The mouth or oral cavity serves as the first portion of the digestive system. The oral cavity is situated anteriorly on the face, under the nasal cavities. It opens to the face through the oral fissure, while posteriorly the oral cavity communicates with the oropharynx through a narrow passage called the oropharyngeal isthmus (also termed the isthmus of the fauces). The cavity is separated into an anterior oral vestibule and the oral cavity proper located posteriorly to the teeth Although a small compartment, the oral cavity is a unique and complex structure with several different nerves and blood vessels inside it. This intricate network is necessary for its unique and diverse role in human life [6].

Vestibule;

The oral vestibule is bounded externally by the lips and the cheek mucosa and internally by the alveolar processes and the teeth. When the teeth are in occlusion, the vestibule communicates with the oral cavity proper via the intermaxillary commissure behind the last molar teeth [7]

Lips;

The lips are the soft, visible part of the humans' mouth and comprise the upper and the lower lips. Together these serve as the gatekeepers of the oral cavity. Externally, the lips' skin forms a junction with the surrounding facial skin, which is marked by the vermilion border (also called the cupid's bow in the case of the upper lip). Internally, it forms a junction with the mucous membrane inside the oral cavity. The lips help in food intake and in articulation of speech. Moreover, being tactile sensory organs and due to their rich sensory innervation, they also serve as erogenous zones in acts of intimacy. Additionally, lips also contribute to the facial expressions [8].

Oral Cavity proper;

It is filled mostly with then tongue and is bound anterolaterally by the posterior surface of the teeth and gums, superiorly by the soft and hard palate, inferiorly by the floor of the mouth and communicates posteriorly with the oropharynx.

Tongue [9];

The tongue is predominantly muscle. There are 8 in total; 4 intrinsic muscles (They are responsible for many of the tongue's functions; such as talking, mastication and any other action that requires the tongue to move. These muscles control movements such as twirling, curling, flattening and broadening of the tongue) and 4 extrinsic muscles (assist the tongue and support it in more complex actions such as protrusion and retraction). Besides the muscles, the other important feature of the tongue is its mucosa. The dorsal tongue mucosa is covered with lingual papillae which function as the sensory receptors for taste. All of the tongue muscles are innervated by the hypoglossal nerve (CN XII), except for the palatoglossus muscle which is supplied by the vagus nerve (CN X).

Palate (8);

The palate is a bony/muscular partition that forms the roof of the oral cavity and the floor of the nasal cavities. It consists of two main parts; the hard palate and soft palate. The hard palate is the anterior bony portion, while the soft palate is the posterior muscular part. The palate completely separates the oral cavity and nasal cavities. This division is essential for preventing pressure changes within these cavities, thus enabling important processes such as suckling and breathing. Additionally, due to its position and structure, the palate plays an important role in articulation (formation of speech), digestion and swallowing.

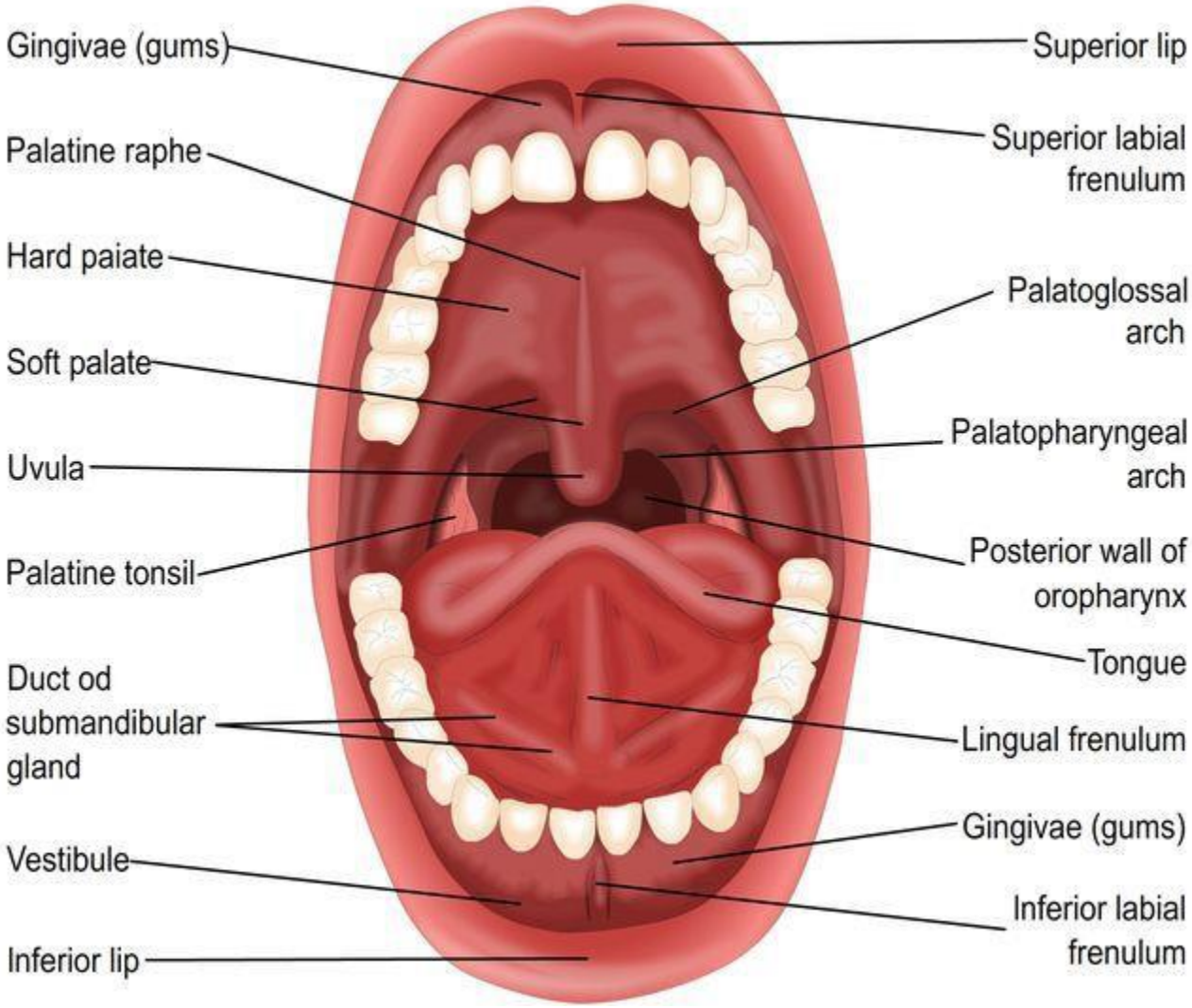


Fig 1 : Anatomy of the oral cavity

II.2 CRANIOFACIAL GROWTH AND DEVELOPMENT

Craniofacial development is a highly coordinated process under a tight genetic control and environmental influence. The development of the craniofacial skeleton occurs as a result of a sequence of normal developmental events: brain growth and development, optic pathway development, speech and swallowing development, airway and pharyngeal development, muscle development, and tooth development and eruption [10].

ii.2.i Brachial Arches

Majority of the craniofacial skeleton is of ectomesenchymal origin whereas the other skeleton of the entire body is derived from mesoderm. In specific areas of the developing embryo, the migrating and rapidly proliferating ectomesenchymal cells develop elevations between ectoderm and endoderm. In the somite period, 4th week IUL, such elevations are seen in the ventral foregut resulting in the formation of six pharyngeal arches or brachial arches bilaterally, the fifth arch perishes; finally, only five arches remain. The arches are separated by 4 branchial grooves on the ectodermal aspect and 5 pharyngeal pouches on the endodermal aspect. Mesenchymal cells migrate between the ectoderm and endoderm and around the mesodermal condensation. Branchial arches decrease in size craniocaudally. Each branchial arch gives rise to some specific derivatives and every arch has the following structures: A cartilage rod, centrally located, forms the skeleton of the arch; a branchiomere that gives rise to the muscles of the arch; a vascular component, aortic arch artery, supplying the area; a nervous element, giving rise to sensory and specific visceral motor fibers for the cranial nerve supplying specific arch[11].

Table I shows the different brachial arches as well as their derivatives.

Table I; Brachial arch derivatives

ARCH	NERVE	SKELETAL DERIVATIVE	POUCH DERIVATIVE	MUSCLE DERIVATIVE	ARCH ARTERY DERIVATIVES
First (Mandibular)	Trigerminal	Greater wing of sphenoid, malleus, incus, maxilla, zygoma, mandible, anterior ligament of malleus, sphenomandibular ligament	Auditory tube, middle ear cavity	Muscles of mastication,anterior belly of digastric, mylohyoid, tensor tympani, tensor veli palatine	Portion of external carotid arteries
Second (Hyoid)	Facial	Stapes,styloid process,lesser cornu and upper hyoid, stylohyoid ligament	Palatine tonsillar fossa	Muscles of facial expression, posterior belly of digastric, stylohyoid, stapedius	Tympanic branch of internal carotid artery
Third	Glossopharyngeal	Greater cornu and lower part of hyoid	Inferior parathyroids,thymus	Stylopharyngeus	Common carotid and proximal internal carotid arteries
Fourth	Superior laryngeal of vagus	Laryngeal cartilages	Superior parathyroid, lateral thyroid	Pharyngeal constrictors,cricothyroid, levator veli palatine, palatoglossus	Left arch of aorta, brachiocephalic and right subclavian arteries, distal pulmonary arteries
Fifth/Sixth	Recurrent laryngeal of vagus	Laryngeal cartilages	Ultimobranchial body	Laryngeal muscles except cricothyroid, striated muscle of esophagus	Proximal pulmonary arteries, ductus arteriosus

II.2.ii Formation of the Face

The face derives from five prominences that surround a central depression, the *stomodeum* which constitues the future mouth. These prominences are the single median frontonasal prominence and the paired maxillary and mandibular prominences. Facial development occurs mainly between the fourth and eighth weeks of gestation as follows[12] :

- Fourth week of development

Primordia of the face appear at the cephalic end of the embryo.

Two nasal placodes cap the bulbous frontal prominence.

The optic discs appear posterolateral to the frontal prominence.

Three paired branchial arches have formed.

The first arches split into maxillary and mandibular prominences. The hyoid arches are the second pair.

Between the first arches and frontal prominence, the buccopharyngeal membrane becomes fenestrated.

- Fifth week of development

Nasal pits develop in the nasal placodes, and the rims of the placodes differentiate into medial and lateral nasal prominences.

The lens vesicles invaginate and close within the optic discs.

The mesenchyme of the mandibular arch fills in across the midline.

The caudal end of the medial nasal prominences begins to fuse with the maxillary prominences.

- At the beginning of the sixth week of development

The nasals have shifted to a more ventral, central position.

Growing and shifting subectodermal mesenchyme smooths out the furrows between prominences and arches, and the second arch becomes more massive.

Six auricular hillocks, which will become the pinna of the ears, form on the mandibular and hyoid arches.

- By the end of the sixth week of development

Medial and lateral nasal prominences fuse.

Maxillary prominences begin the formation of the upper jaw.

The midline approximation of the medial nasal prominences forms the nasal septum.

The mandible appears as a band of dense fibrous tissue known a Meckel's cartilage; this cartilage provides a framework around which the bone will form.

- At the beginning of the seventh week of development

The tip of the nose is elevated between the medial nasal prominences and is visible in profile.

Eyelids become prominent.

The pinna of the ear takes shape.

- End of the seventh week of development

The pattern of facial features has taken on a human appearance. However, facial proportions develop during the fetal period.

Bone formation commences at the mental foramen area and begins to spread backwards, forwards and upwards outlining the future body of the mandible.

The fusion of the medial nasal prominences, which forms the central axis of the nose and the philtrum of the lip, is complete.

From the beginning of the eighth week of development till birth, the final facial development occurs slowly and consists mainly of changes in the proportion and relative positions of the facial components. During the early fetal period, the nose is flat and the mandible is underdeveloped. They obtain their characteristic form while facial development is being completed. As the brain enlarges, it creates a prominent forehead, the eyes move medially, and the

external ears rise. The prenatal face is small because of the rudimentary upper and lower jaws, the unerupted primary teeth, and the small size of the nasal cavities and maxillary sinuses.

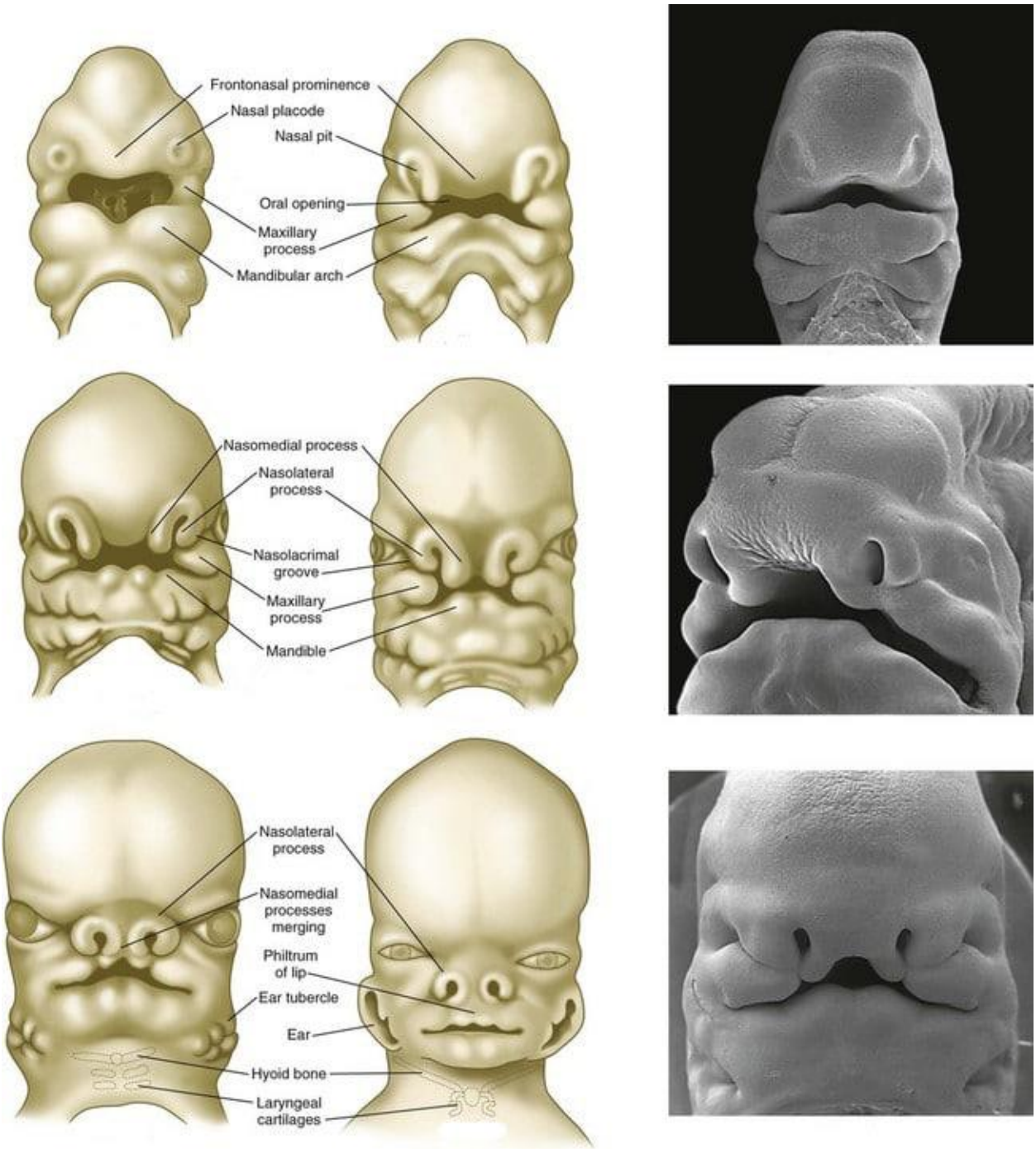


Fig 2; Prenatal development of the face

II.2.iii POST NATAL GROWTH OF THE MAXILLA AND MANDIBLE

a- Growth of the Maxilla

Since, the maxillary complex is attached to the cranial base, there is a strong influence of the latter on the former. Hence, while discussing the growth of nasomaxillary complex, we have to look into three aspects [13];

1) The displacement in the position of the maxillary complex

-Primary displacement occurs in a forward direction. This occurs by growth of the maxillary tuberosity in a posterior direction .This results in the whole maxilla being carried anteriorly.

-Secondary displacement- Occurs in a downward & forward direction as the cranial base grows.

2) Growth at sutures:

- Sutural connective tissue ; Proliferation, ossification, surface apposition, resorption and translation are the mechanisms for maxillary growth.

- The maxilla is related to cranium at least partially by the: Frontomaxillary suture, frontonasal suture, zygomaticomaxillary suture, zygomaticotemporal suture and pterygogopalatine suture. These sutures are all oblique & more or less parallel with each other. The growth in these areas would serve to move the maxilla downward & forward.

3) Surface Remodeling:

Remodeling occurs by bone deposition & resorption to bring about increase in size, change in shape and change in functional relationship.

Bone resorption is seen oin the floor of the nasal cavity. To compensate, there is bone deposition on the palatal side. Thus, a net downward shift leading to increase in maxillary height.

Bone deposition occurs along the posterior margin of the maxillary tuberosity. This causes lengthening of the dental arch and enlargement of the anteroposterior dimension of the entire maxillary body.

Growth timings of the maxilla

1 – 5 years of age; 45% of total growth completed

5 – 10 years of age; 65% of total growth

10 – 20 years of age; Remaining 35% completed.

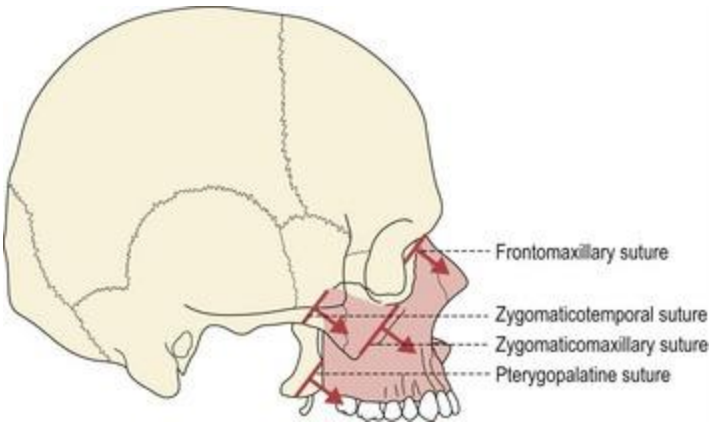
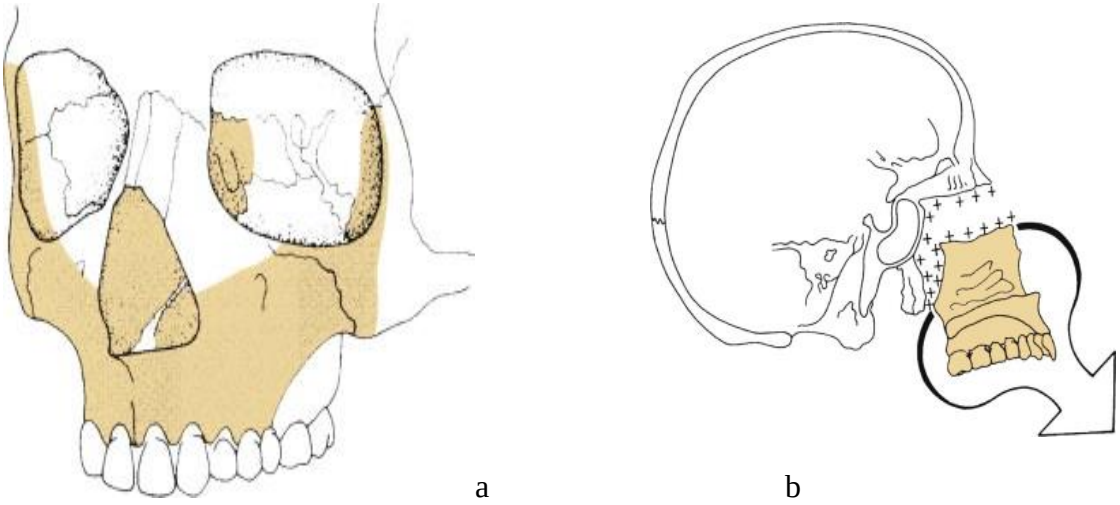


Fig 3; Downward and forward growth of the nasomaxillary complex as a result of sutural growth



a b

Fig 4; Secondary displacement (a) and remodeling (b)

b- Growth of mandible

At birth the two rami of the mandible are short, condylar development is minimum and there is no articular eminence in glenoid fossa. A thin layer of fibrocartilage & connective tissue exists at the midline of symphysis to separate right & left mandibular bodies [14].

At fourth month of age and end of first year symphysial cartilage is replaced by bone.

During first year of life appositional growth is active at alveolar border, at distal & superior surfaces of the ramus, at the condyle, along the lower border of mandible and on its lateral surface.

After the first year of life these changes occur ;

- Mandibular growth becomes more selective, condyle shows considerable activities, mandible moves and grows downward & forward.

- Appositional growth occurs on posterior border of the ramus and on the alveolar process.

- Resorption occurs along the anterior border of ramus lenthening the alveolar border & maintaining the anterior- posterior dimension of ramus.

- Gonial angle changes after little muscle activity.

- Transverse dimension is mainly due to growth at posterior border in an expanding V pattern.

- The two rami also diverge outward from below to above so that additive growth at coronoid notch coronoid process &condyle also increses the superior inter-ramus dimension.

- Alveolar process of mandible grows upward & outward on an expanding arc. This permit dental arc to accommodate the larger permanent teeth.

- On lingual surface, behind the chin heavy periosteal growth occurs, with the dense lamellar bone merging and overlaping on the labial side of the chin.

- In males, the apposition of the bone at symphysis seems to be about the last change in shape during the growing period. This change is much less apparent in the females.

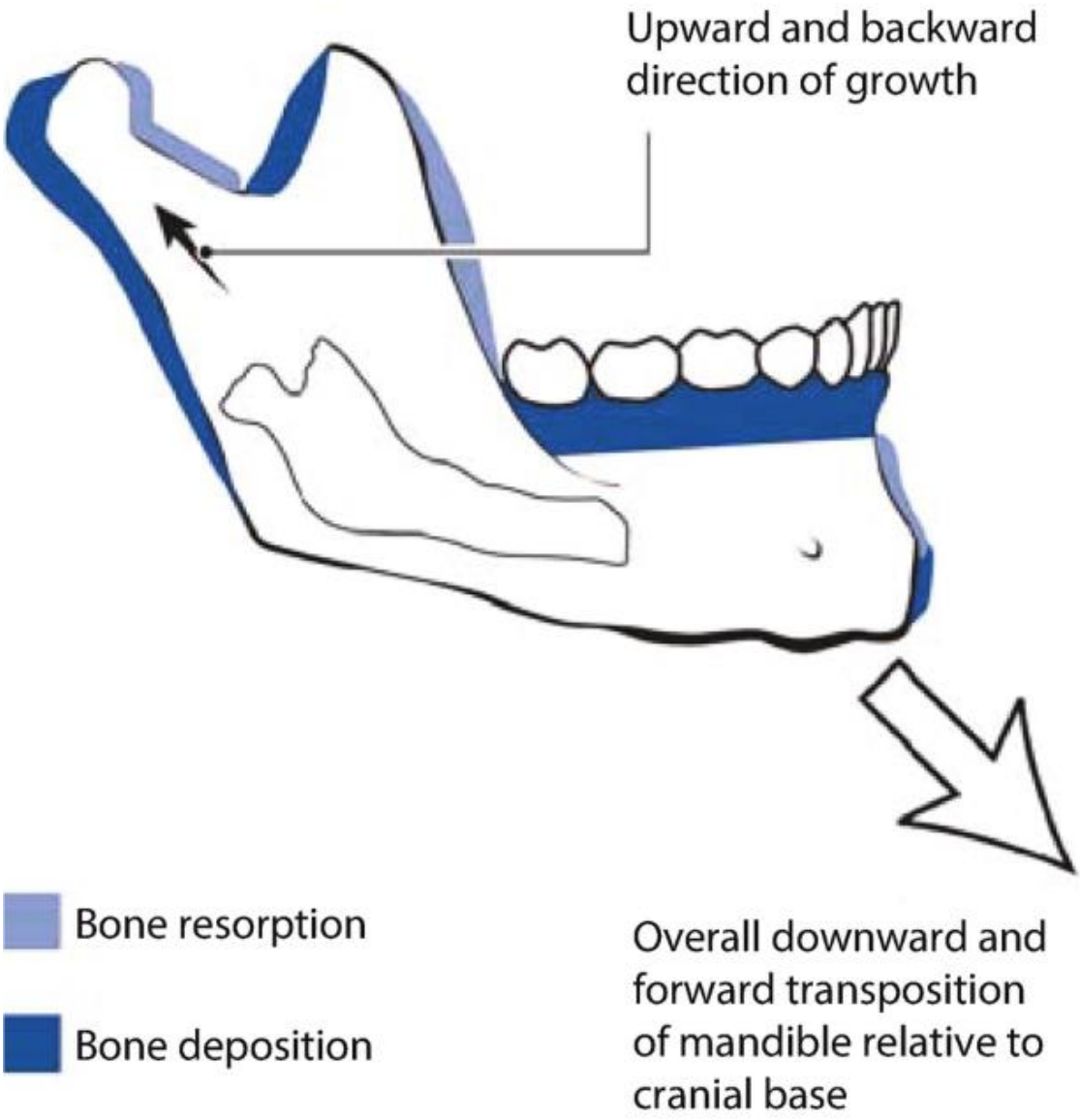


Fig 5; Mandibular growth pattern

II.3 TOOTH DEVELOPMENT

II.3.i Development of the tooth germ

The tooth germ develops in three stages: bud, cap and bell [15].

Bud- At 8 weeks of intrauterine life, clumps of mesenchymal cells induce the dental lamina to form swellings known as enamel organs. Each enamel organ will be responsible for the development of each tooth.

Cap- As the enamel organs grow and increase in size, the inner aspect becomes concave resembling skull caps. By the late cap stage, at 12 weeks of intrauterine life, cells on the inner aspect of the enamel organ change from cuboidal to columnar forming the inner enamel epithelium. The outer layer of cells remains cuboidal and is known as the outer enamel epithelium. Beneath the inner enamel epithelium the condensation of mesenchymal cells is termed the dental papilla; this will eventually become the pulp. A fibrous capsule surrounds each enamel organ and this is termed the dental follicle; this will eventually become the periodontal ligament.

Bell

By 14 weeks of intrauterine life the enamel organ consists of the following:

Inner enamel epithelium:

-Cells lining the inner surface of the enamel organ which are columnar in shape.

-The inner enamel epithelium defines the shape of the crown.

-They will eventually differentiate into enamel forming cells (ameloblasts).

Stratum intermedium:

-Lies over the inner enamel epithelium.

-Consists of two to three layers of cells.

-Transports nutrients to and from the ameloblasts.

Stellate reticulum:

-Lies between the stratum intermedium and the outer enamel epithelium.

-It consists of star-shaped cells that protect the underlying dental tissues.

-It also maintains the shape of the tooth.

Outer enamel epithelium:

-Cells lining the outer surface of the enamel organ. They are cuboidal in shape.

-They maintain the shape of the enamel organ.

-The outer enamel epithelium meets with the internal enamel epithelium at the cervical loop.

Eventually the inner and outer enamel epithelium grows downwards at the cervical loop forming Hertwig's root sheath, which maps out the shape of the root.

At the late bell stage the dental lamina disintegrates and is ready for the formation of dental hard tissue. Dentine formation always precedes enamel formation.

II.3..ii Dentine formation (Dentinogenesis)

-Late bell stage-the inner enamel epithelium cells have mapped out the shape of the crown.

-The inner enamel epithelium cells induce cells at the periphery of the dental papilla to form columnar odontoblast cells (dentine-forming cells).

-Odontoblast cells begin to secrete an unmineralised dentine matrix.

-As more dentine matrix is deposited, the odontoblast cells retreat in the direction of the pulp leaving an elongated process known as the odontoblast process.

-The dentine matrix formed prior to mineralisation is termed predentine. A narrow layer of predentine is always present on the surface of the pulp.

-Mineralisation of dentine begins when the predentine is approximately 5 μm thick.

-Spherical zones of hydroxyapatite called calcospherites are formed within the dentine matrix.

-Mineralisation of the dentine matrix starts at random points and eventually these calcospherites fuse together to form mineralised dentine.

-Dentinal tubules form around each odontoblast process.

-The odontoblasts retreat in S-shaped curves towards the dental papilla.

-The first layer of mineralised dentine is called mantle dentine and the remaining bulk of the mineralised dentine is known as circumpulpal dentine.

II.3.iii Enamel formation (Amelogenesis)

-Immediately after the first layer of dentine is formed, the inner enamel epithelium ameloblast cells (enamel forming cells).

-The ameloblast cell is columnar in shape with its base attached to cells of the stratum intermedium.

-At the secretory end of ameloblast cells is a pyramidal extension called the *Tomes' process*.

-The enamel matrix is secreted through the Tomes' process at the amelodentinal junction.

-Calcium and phosphate ions are secreted into the enamel matrix and mineralisation of enamel occurs immediately, forming hydroxyapatite crystallites.

-As more enamel matrix is secreted and mineralised, the ameloblast cells move away from the amelodentinal junction forming a pattern of crystallites, which are contained within enamel prisms.

-Enamel prisms are also known as enamel rods they run from the amelodentinal junction to the enamel surface.

-During maturation from pre-enamel to mature enamel, the enamel crystallites increase in size and the organic content is reduced.

-On completion of enamel formation the ameloblast cell loses the Tomes' process, flattens and becomes the reduced enamel epithelium.

-The reduced enamel epithelium protects the enamel during eruption and will eventually become the junctional epithelium.

II.3.iv Formation of the root

-Occurs when the crown has completed.

-The internal and external enamel epithelium grows downwards at the cervical loop to form a double layered epithelial wall – Hertwig's root.

-The Hertwig's root sheath grows apically mapping out the shape of the root enclosing the dental papilla.

-The dental follicle lies external to the Hertwig's root sheath.

II.3.v Cementum formation (Cementogenesis)

-The Hertwig's root sheath induces the formation of odontoblast cells.

-When root dentine has formed, Hertwig's root sheath fragments allowing adjacent cells from the dental follicle to come into contact with the root dentine.

-These cells differentiate into cementoblasts (cementum-forming cells).

-Cementoblasts are cuboidal in shape and form a single layer on the surface of the root dentine.

-The cementoblasts secrete cementum matrix and crystallites of hydroxyapatite are deposited in this matrix and mineralisation occurs.

-During formation, a thin layer of unmineralised cementum is always present on the surface; this is known as *cementoid*.

II.3.vi Formation of the periodontal ligament

-Cells within the dental follicle give rise to fibroblasts that secrete collagen.

-Once cementum formation has begun, collagen fibres within the dental follicle orientate themselves into bundles, which are perpendicular to the root surface.

-These fibres will form the principal fibres of the periodontal ligament.

-The ends of these fibres become embedded in the developing cementum and alveolar bone and are known as Sharpey's fibres.

II.4 TOOTH ERUPTION

Tooth eruption is the bodily movement of a tooth from its development position into its functional position in the oral cavity. It can be broken down into two phases; the pre-functional eruptive phase and the functional eruptive phase[16].

Prefunctional phase

During the prefunctional phase, crown formation has completed.

As root formation begins the developing tooth begins to erupt.

The overlying alveolar bone is resorbed by osteoclasts and gradually the tooth moves in an axial direction towards the oral cavity.

The enamel surface of the tooth is covered by the reduced enamel epithelium which fuses with the oral epithelium.

The pressure from the tip of the tooth breaks down the oral epithelium allowing the tooth to emerge into the oral cavity without any rupturing of blood vessels.

Once the tooth has emerged, the reduced enamel epithelium is known as the epithelial attachment.

Tooth eruption continues until the tooth contacts (occludes with) the opposing tooth in the opposite jaw.

Functional eruptive phase

The functional eruptive phase continues throughout life due to functional changes.

The alveolar bone continuously remodels in response to tooth movement and enamel wear allowing teeth to maintain contact with each other and with opposing teeth.

Mechanisms of tooth eruption

The eruptive force of tooth eruption is unclear; however, several theories have been put forward although there is little evidence to support them. These are:

Root growth generates a force beneath the tooth, elevating the tooth towards the oral cavity.

Remodelling and deposition of the bone beneath the developing tooth pushes the tooth upwards.

Traction of the periodontal fibres exerts an upward pull on the tooth.

Cellular proliferation at the base of the pulp creates pressure that pushes the tooth from the dental follicle.

An increase in tissue fluid or blood pressure generates an eruptive force on the tooth.

Table II shows the calcification, eruption and exfoliation dates of primary teeth while Table III shows the calcification and eruption dates of permanent teeth.

Table II ; Approximate dates of tooth development, eruption and exfoliation for the primary dentition.

	Approximate calcification date	Approximate eruption date	Approximate exfoliation date
Upper and lower primary incisors(A's)	3-4 months in utero	6-8 months	6-7 years
Upper and lower primary lateral incisors(B's)	4.5 months in utero	7-9 months	7-8 years
Upper and lower primary firat molars (D's)	5 months in utero	16-18 months	9-12 years
Upper and lowerr primary canines(C's)	5 months in utero	16-18 months	9-12 years
Upper and lower primary second molars (E's)	6 months in utero	20-24 months	10-12 years

Table III ; Approximate dates of tooth development and eruption for the permanent dentition.

Tooth (in order of eruption)	Approximate initial calcification date	Approximate eruption date
Upper and lower permanent first molars (6's)	At birth	6–7 years
Upper and lower permanent central incisors (1's)	3–4 months	6–7 years
Upper and lower permanent lateral incisors (2's)	Upper 10–12 months	7–8 years
Lower	3–4 months	
Lower permanent canines (3's)	4–5 months	9–10 years
Upper and lower permanent first premolars (4's)	1–2 years	10–11 years
Upper and lower permanent second premolars (5's)	2–3 years	11–12 years
Upper permanent canines (3's)	4–5 months	11–12 years
Upper and lower permanent second molars (7's)	2–3 years	12–13 years
Upper and lower permanent third molars (8's)	7–10 years	18+ years

II.5 HUMAN DENTITION AND OCCLUSION

Humans have two sets of dentition in their lifetime- temporary and permanent dentition. The temporary (primary) dentition comprises the first set of teeth to erupt in children which are 20 in number. The permanent dentition is comprised of 32 teeth. All these set of teeth are evenly distributed between the maxillary and mandibular arches. These arches are equally divided into 4 quadrants [17]. There are four main types of teeth – incisors, canines, premolars, and molars. The premolars are only present in the permanent dentition. Each tooth is made up of two parts- the crown of the tooth is the visible part of the tooth in the mouth, while the root is hidden beneath the gingiva and alveolar bone [18]. The gingiva covers the border of the alveolar process that is adjacent to the teeth. The cementoenamel junction is the anatomical boundary between the enamel-covered crown and cementum covered root. Dentin makes up the core of the entire tooth that surrounds the pulp, which contains the neurovascular structures. The apical foramen at the root apex is where the neurovascular structures enter the tooth and travel up the root canal to the expanded pulp chamber of the crown. The roots of the tooth vary depending on the type of tooth. The molars typically have three roots: a lingual root on the lingual aspect and a mesiobuccal root and distobuccal root on the buccal aspect. The crown of the tooth has five surfaces. The surface facing the lip or cheek is called the facial surface for incisors and canines and buccal surfaces for premolars and molars. The surface facing the inside of the mouth is referred to as the palatal surface in the maxilla and the lingual surface in the mandible. The surfaces referring to the boundaries of adjacent teeth are called mesial and distal. Mesial refers to the surface closer to the midline of the face, and distal refers to the surface away from the midline of the face. The biting surface is called the occlusal surface [19].

Occlusion is the relationship between the maxillary and mandibular teeth at rest (static occlusal relationship) and in function during various jaw movements (dynamic occlusal relationship) [20].

-Centric occlusion (CO) is the occlusion the patient makes when they fit their teeth together in maximum intercuspation. It is the contact between the greatest number of opposing teeth. This

is the occlusion the patient nearly always makes when they are asked to bite together as it is the bite they are habituated to.

-Centric relation (CR) is the mandible's relationship to the maxilla when the condyles are in their most anterior superior position in the glenoid fossae.

II.5.i Classification of static occlusion

Key classifications are;

British standards institute classification of incisor relationship

This is the relationship between the maxillary and mandibular incisors when in centric occlusion [21].

-Class I-The lower incisal edges occlude with or lie immediately below the cingulum plateau of the upper incisors.

-Class II-The lower incisal edges occlude posterior to the cingulum plateau of the upper incisors. It is further divided into two divisions:

Division I: the upper central incisors are proclined, usually resulting in an increased overjet

Division II: the upper central incisors are retroclined, usually resulting in a decreased overjet

-Class III-The lower incisal edges occlude anterior to the cingulum plateau of the upper incisors

Canine Classification [22]

-*Class I*: mesial incline of the upper canine overlaps the distal slope of the lower canine (The maxillary canine occludes between the mandibular canine and 1st premolar).

-*Class II*: Distal slope of the maxillary canine occludes or contact the mesial slope of the lower canine.

-Class III: The mandibular canine is displaced anterior to the maxillary canine with no overlapping.

Molar Classification (Angle's classification) [23]

-Class 1 (Normocclusion)-The mesiobuccal cusp of the maxillary first molar occluding with the buccal groove of the mandibular first molar i.e. the maxillary first molar is slightly posteriorly positioned relative to the mandibular first molar.

-Class 2 (Distoocclusion)- The mesiobuccal cusp of the maxillary first molar occluding anterior to the buccal groove of the mandibular first molar i.e. the maxillary first molar is in line with or anteriorly positioned relative to the mandibular first molar. It is further divided into 2 divisions;

Class 2 division 1 – Class 2 molars with normally inclined or proclined maxillary central incisors.

Class 2 division 2 – Class 2 molars with retroclined maxillary central incisors.

- Class 3(Mesiocclusion)-The mesiobuccal cusp of the maxillary first molar occluding posterior to the buccal groove of the mandibular first molar i.e. the maxillary first molar is severely posteriorly positioned relative to the mandibular first molar.

II.6 PARAFUNCTIONAL HABITS

Habits stem from the repetition of the same action over time. Repetitive behaviors are common in infantile period and most of them are started and finished spontaneously [24]. Generally, oral habits can be divided into 2 main groups [25];

-Physiological or Functional such as chewing and swallowing.

-Parafunctional (deleterious) habits, such as finger and thumb sucking, pacifier and bottle sucking etc

Persistence of parafunctional oral habits during and beyond preschool age are one of the important etiological factors in developing malocclusion and other ill effects on orofacial

structures [26]. The effect of parafunctional habits on the dentition is intensity, frequency, and duration dependent.

Deleterious oral habits can act in such a way to disrupt the muscular balance mentioned above, causing significant interferences in the normal development of the maxillary bones, correct positioning of teeth, and respiratory, deglutition and phonation processes [27].

II.6.i Types of Parafunctional Habits

- **Thumb-sucking;**

Thumb sucking is one of the most common habits of children. The habit starts early in life. About 90% of newborns show some form of hand sucking by 2 hours after birth. Thumb sucking is normal in infants and young children. It should cause no permanent problems if it stops by age 5 or before the eruption of permanent incisors [17].

Sucking a thumb gives a sense of safety or joy to the infants; and helps them better understand the world around themselves. On the other hand, thumbs placed inside the mouth exert force on the tissues thus creating physical changes as dental and maxillofacial abnormalities [28].

There are 2 types [27]:

- Active: In this type, there is a heavy force by the muscles during the sucking and if this habit continues for a long period, the position of permanent teeth and the shape of mandible will be affected.

- Passive: In this type, the child puts his/her finger in mouth, but because there is no force on teeth and mandible, so this habit is not associated with skeletal changes.

Some effects of thumb sucking include anterior open bite, increased overjet, lingual inclination of lower incisor and labial inclination of upper incisors, posterior cross bite, deep palate, speech defect, finger defects (Eczema of the finger due to alternate dryness and moisture that occurs and even angulations of the finger).

- **Nail biting or onychophagia**

Nail biting is a common and untreated medical problem among children. Complications caused by nail biting include malocclusion of the anterior teeth, root resorption intestinal parasitic infections, change of oral carriage of Enterobacteriaceae, bacterial infection and so on [29].

- **Mouth breathing**

Effects of mouth breathing include large overbite and crowded teeth, poor posture, inflamed tonsils, dry cracked lips, dry mouth which leads to bad breath, periodontal disease and tooth cavities. It can equally worsen symptoms in people with asthma [30]

- **Tongue thrusting**

Tongue thrust is defined as a condition in which the tongue makes contact with anterior teeth during swallowing and even continuously at random moments. Normal mature swallow shows the positioning of the tongue high on the palate behind the maxillary incisors and no lip and cheek activity during swallowing. A transitional swallowing pattern is seen in mixed dentition, when some primary teeth are lost and permanent are yet to erupt or are erupting. This type of swallow is self-correcting. In cases of open bite mostly created by habits like thumb sucking, the tongue gets thrusted ahead to achieve a lip seal. This type of tongue thrust is called a "Simple Tongue Thrust".

"Complex tongue thrust" is seen in individuals with a diffuse open bite, seen most commonly in mouth breathers and in a child with a history of chronic nasorespiratory disease/allergies [31]. Tongue thrusting can result in increased overjet, anterior open bite, posterior crossbite, labial incompetence (when at rest an open mouth position with a forward tongue posture is noted e.g while watching television or reading a book), difficulty with speech, especially the s and z sounds etc. [32]

- **Bruxism**

Bruxism, defined as a habitual nonfunctional forceful contact between occlusal tooth surfaces, is involuntary, excessive grinding, clenching or rubbing of teeth during nonfunctional movements of the masticatory system. Bruxism may occur during the day or during sleep. Bruxism has become an increasing concern in children due to its negative effects on life quality and also for being considered an important risk factor for temporomandibular dysfunctions. It may cause

tooth wear and, in more severe cases, dental traumas. Recent studies have indicated a relation between bruxism and respiratory alterations (27).

- **Tongue sucking**

When a child has a tongue sucking habit, he constantly sucks on the tongue as though on candy. The pressure put by children between the teeth while sucking the tongue causes incorrect swallowing and speech. If this disorder persists, it may have a devastating effect on a child's dental growth provoking more commonly an open bite and oral health in general (28).

Management of Parafunctional habits

Old habits are hard to break and new habits are hard to form because the behavioral patterns we repeat are imprinted in our neural pathways, but it is possible to form new habits through repetition. In order to replace the adverse oral habits by good habits, a wholistic approach is indicated, which includes patient-parent counselling, behaviour modification techniques, use of habit breaking appliances, followed by recall visits and reinforcement [29]. Prevention and interception of these deleterious oral habits at an early stage is of utmost important for the good oral health of the children.

These treatment methods include [33];

1. Psychological therapy- Behavior shaping and modification and stress relief.

2. Reminder therapy

Extraoral approach: Ace bandage and long night sleeve gown.

Intraoral approach: removable appliances with palatal cribs.

3. Mechanotherapy-

Palatal crib appliance

Bluegrass appliance by Haskell and Mink consists of an acrylic roller that is placed in the most superior position of the palate with no contact onto the palatal tissues so that the roller can be moved freely with the tongue and this is welded onto the molar bands. Patient is asked to roll the roller with the tongue whenever he/she feels like thumb sucking.

Hay rake appliance consists of either sharp/blunt points/rakes can also feature loops or a palatal bar with short, blunt protuberances forming a hybrid which interferes with the digit or tongue while digit sucking or tongue thrusting and serves as a negative/painful feedback.

Quad helix appliance.

Electronic devices have been used like Alarming wrist watch consisted of a new device by *Krishnappa et al* with an alarm system that gets activated when the child placed the finger in the mouth. The alarm was incorporated in a wristwatch that made it appealing for the child to wear it and thus cooperated [34]

II.7 MALOCCLUSION

Malocclusion is a form of relationship of the upper and lower jaw which deviate from the standard form that is accepted as a normal. On the sagittal planet, the basis for assessment is the intermaxillary positions of the first molars- ANGLE'S Classification [23] as seen previously. Other manifestations of malocclusion include;

Open bite

Open bite is condition in which there is the presence of occlusal or incisal space between the teeth when the upper jaw and lower jaws are in centric occlusion.

Anterior open bite is a malocclusion with no contact in the anterior region of the dental arches, and the posterior teeth in occlusion. It is called combined open bite when malocclusion extends to the posterior segment.

Posterior open bite is failure of contact between the posterior teeth when the teeth occlude in centric occlusion, there is no occlusion between the maxillary and mandibular premolars. The

maxillary and mandibular molars have a slight contact. The anterior overjet and overbite are normal [17].

Deep bite

Deep bite is defined as an excessive vertical overlap of the incisors, i.e. vertically, where more than two-thirds of the buccal surfaces of the mandibular incisors are covered by the maxillary incisors. Most often, the reason for deep bite is an over-eruption of the incisors or an anterior rotation of the mandible. A deep bite occasionally manifests with contact between the edges of the mandibular incisors and the palatal mucosa behind the maxillary incisors [35].

Posterior Crossbite

In a posterior crossbite, the buccal cusps of the maxillary premolars and/or molars occlude lingually to the buccal cusps of the mandibular premolars and/or molars. The posterior crossbite can be either unilateral or bilateral. Unilateral crossbites of dento- alveolar origin are caused by palatal tipping of the maxillary premolars and molars, and is most often accompanied with a forced guidance of the mandible, thus deviating the midline of the mandible to the crossbite (29).

Crowding

Dental crowding is defined as an inconsistency between tooth size and arch dimension that results in malocclusion; it occurs because of a lack of coordination between tooth size and arch dimensions leading to limited space for proper eruption [36].

REVIEW OF LITERATURE ON THE SUBJECT

Although the prevalence of oral parafunctional habits and dental malocclusions vary in literature, several researches carried out around the world indicate a high prevalence.

A study in Cameroon in June 2022 by Kalla *et al.* showed that the most common parafunctional habit was thumb sucking (17.4%) with the higher proportion of thumb suckers being girls (63.79%) with an overall mean age of 4.80+-5 years. The highest proportion of thumb sucking was found in firstborn children (39.65%) and in those who breastfed for less than 6 months (85.62%) [3]

A worldwide study carried out in 2020 showed that the worldwide prevalence of malocclusion was 56% without differences in gender. The highest prevalence was in Africa (81%) and Europe (72%), followed by America (53%) and Asia (48%). The distributions of Class I, Class II and Class III malocclusions in Africa were found to be 76.9%, 9.7% and 4.0% respectively. Regarding vertical malocclusions, the observed deep bite and open bite were 10.9% and 6.5% respectively. Cross bites affected 9.8% of the sample [37].

However, we could find few studies have been carried out evaluating pediatricians' knowledge, attitudes and practices towards parafunctional habits and malocclusions.

A study conducted by Maden *et al.* in Turkey evaluating pediatricians' knowledge, attitude and practices on parafunctional habits and orthodontic problems in children revealed low level of knowledge on some aspects of parafunctional habits and orthodontic problems. The practice scores were lower (61.2%) compared to attitude scores (94.0%) and knowledge scores (71.2%) [5].

Kumar *et al.* in India researched the knowledge and attitude of pediatricians towards digit sucking in children. This study showed that many respondents were unaware that oral habits could be responsible for malocclusion. A high percentage of respondents preferred not to examine oral features in digit sucking child. Among the etiological factor that may contribute to digit sucking habit in a child, most of the respondents expressed that habitual, psychological and inadequate parental care are possible causes. Most of the participants answered that parental and child counseling is essential to stop the habit. Most of the respondents did not refer the digit sucking child to the dentist for the better management of associated malocclusion [1].

As seen above, similar studies were transverse and descriptive in nature which provides a comprehensive picture of the characteristics, behaviors, and attributes of the population which can be useful in informing future research and policy decision.

CHAPTER III: METHODOLOGY

III.1 STUDY TYPE

This is a descriptive cross-sectional study.

III.2 STUDY SITE

Cameroon.

III.3 STUDY PERIOD

STUDY DURATION- The study lasted from November 2023 to June 2024

DATA COLLECTION PERIOD- February to March 2024

III.4 STUDY POPULATION

III.4.i Target population

This study targeted pediatricians in Cameroon.

III.4.ii Source Population

Pediatricians in Cameroon.

III.4.iii Inclusion criteria

The criteria for inclusion is any practicing pediatrician who consents to fill the questionnaire.

III.4.iv Non-inclusion criteria

Any physician who doesn't fit the inclusion criteria or doesn't consent to fill the questionnaire

III.4.v Sampling

Type- Consecutive and Exhaustive Sampling

III.5 PROCEDURE

III.5.i-Recruitment

Pediatricians in Cameroon have a whatsapp group called *Communication SOCAPED*. Our questionnaire was shared in that group with reminders sent every couple of days. Also, some pediatricians in Yaounde and Douala were visited in their offices and given the hard copy of the questionnaires to fill.

Questionnaires were printed and submitted to the pediatricians and collected on appointment depending on their availability.

III.5.ii-Administrative procedure

Authorization was gotten at the ethics institutional committee for research of FMBS.

III.6 MATERIALS

Materials for data collection

-Questionnaires

-Google forms

- Pens

Materials for data analysis

Data entry was done using Microsoft Excel 2016.

Analysis was done with the Statistical Package for Social Sciences (SPSS) 23.0.

The data was graded by section; Knowledge, Attitude and Practice (see table IV).

We used the scale for KAP studies by ESSI Marie and Njoya Oudou [38]

Each response was allocated 1 for correct answers and 0 for wrong answers.

-Total marks per section were 21,7 and 10 for the knowledge, attitude and practice sections respectively.

Knowledge was graded as poor, inadequate, average or good.

For attitude, it could be correct, approximative, wrong or poor.

Analysis of the practice was either poor, inadequate or adequate.

Table IV : KAP studies assessment

KAP	Category	Grade
Knowledge	Poor	Less than 50%
	Inadequate	[50-65% [
	Average	[65-80% [
	Good	Above 80%
Attitude	Poor	Less than 50%
	Inadequate	[50-75% [
	Adequate	Above 75%
Practice	Poor	Less than 50%
	Erroneous	[50-65% [
	Average	[65-80% [
	Good	Above 80%

III.7 Ethical Considerations

After protocol validation by thesis supervisors, we sought approval from the Ethical Committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaounde I.

Timeliness and interest of our study for the nation.

Parafunctional habits have been shown to have a negative impact on the developing occlusion which probably accounts for the increasing incidence of malocclusions in children. Cooperation between pediatricians and pediatric dentists will play a fundamental role in prevention.

Voluntary Participation

Participants were not coerced into taking part in the research.

Risk of Harm

There is no risk posed to any of the participants

Confidentiality

Participants' identities were kept secret during and after the research.

Conflict of interest

No conflict of interest were identified or reported during this study

CHAPTER IV: RESULTS

IV.1. STUDY PARTICIPANTS

The aim of our study was to determine the knowledge, attitude and practice of paediatricians in Cameroon regarding parafunctional oral habits and dental malocclusions in children. A total of 159 respondents were encountered, 86 (54.09%) completed the study, 5 (3.14%) did not fill up to 75% of the questionnaires due to lack of time according to their reasons and 68 (42.77%) did not fill the questionnaire due to their busy schedules, numerous appointments without response and other reasons not mentioned.

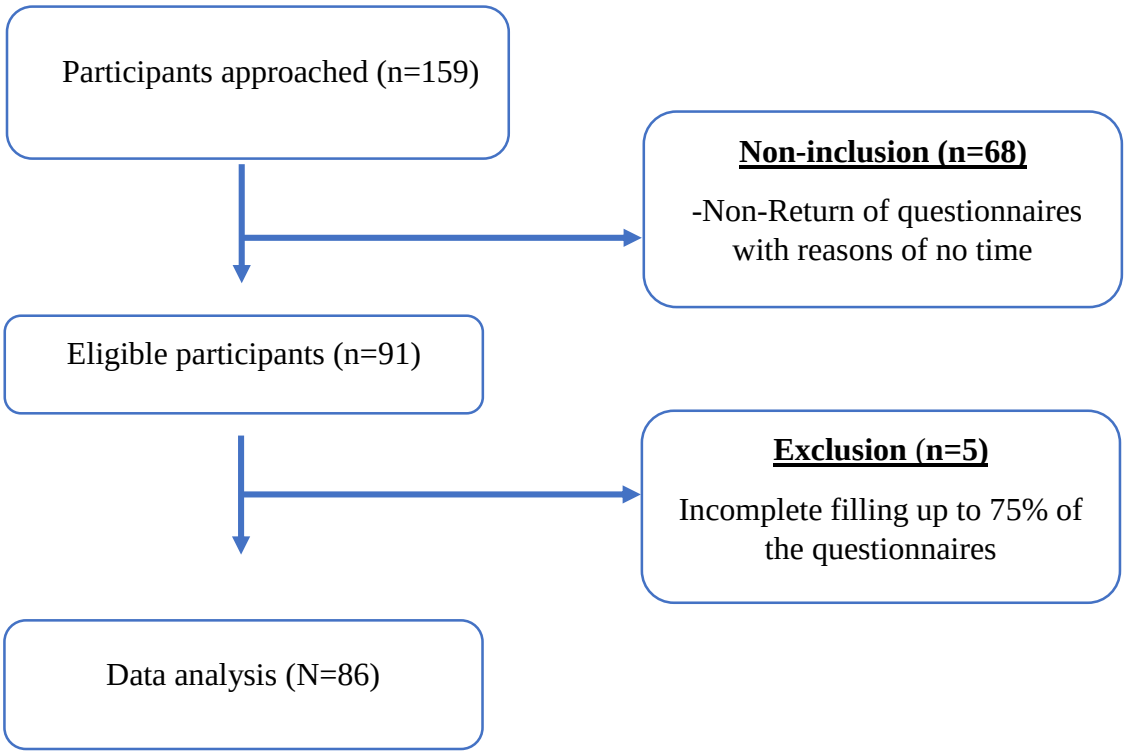


Figure 6; Schematic representation of our study participants

IV.2 SOCIODEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION

Of all the participants, 69.8% (n=60) were female while 30.2% (n=26) were male. With regards to the age distribution, the largest group of our participants 51.2% (n=44) were between the ages 40-49 years old with 44.2% (n=38) practising in both public and private setting. With regards to subspecialty, 30.2% (n=26) had a subspecialty, while 69.8% (n=60) do not.

When considering years of clinical practice, 50.0% (n=43), has 10-19 years of experience and 77.1% (n=67) of the sample spend 40 or more hours in patient care per week with the largest group, 53.5% (n=46) seeing 10-19 patients per day. Geographically, the regions with the highest representation are the Centre and the Littoral with 45.3% (n=39) and 38.4% (n=33) responses respectively, with all other regions making up smaller percentage (Table V)

Table V; Sociodemographic representation of participants

Variable (n=86)	Frequency	Percentage
Age(years)		
30-39	28	32.6
40-49	44	51.2
50+	16	16.3
Gender		
Male	26	30.2
Female	60	69.8
Subspecialty		
Yes	26	30.2
No	60	69.8
Years of clinical practice		
0-9	37	43.0
10-19	43	50.0
20+	6	7.0
Type of practice		
Public practice	31	36.0
Private practice	17	19.8

Both	38	44.2
Hours of patient care per week		
<40	19	22.9
>=40	67	77.1
Number of patients seen per day		
<=10	34	39.5
10-19	46	53.5
20-29	6	7.0
Region of practice		
North west	3	3.5
South west	2	2.3
Centre	39	45.3
Littoral	33	38.4
East	2	2.3
West	5	5.8
Far North	1	1.2
Adamawa	1	1.2

IV.3. RESULTS ON KNOWLEDGE OF PARAFUNCTIONAL ORAL HABITS AND DENTAL MALOCCLUSIONS AND THEIR RELATIONSHIP

According to the results, 43% (n=37) of respondents reported having knowledge that children with parafunctional oral habits are more likely to develop malocclusion, while 57% (n=49) do not. Additionally, 18.6% (n=16) indicated that long-term bottle feeding increases the possibility of malocclusion. Only 2.3% (n=2) of respondents believed that children with snoring/breathing problems are more prone to crowding. 51.2% (n=44) knew that prolonged pacifier use increases the risk of open-bite. Regarding the impact of supporting healthy chewing/swallowing, 43% (n=37) said it can help prevent malocclusion. Furthermore, 9.3% (n=8) reported that nail biting increases the risk of malocclusion, 52.3% (n=45) knew that thumb sucking increases the risk, and 32.6% (n=28) knew that tongue-sucking increases the risk (Table VI).

Table VI; Distribution according to knowledge of risk factors of malocclusion

Variable (N=86)	Frequency	Percentage
Children with parafunctional oral habits are more likely to develop malocclusion.	37	43
Long-term feeding of breast milk or formula with a bottle increases the possibility of developing parafunctional oral habits and malocclusion.	16	18.6
Children with snoring and breathing problems (mouth breathing) are more prone to crowding.	2	2.3
If the pacifier use time is prolonged, the possibility of open-bite increases?	44	51.2
Supporting healthy chewing and swallowing function in early childhood can help prevent malocclusion.	37	43
Nail biting or Onychophagia increases the risk of malocclusion.	8	9.3
Thumb sucking increases the risk of malocclusion.	45	52.3
Tongue-sucking increases the risk of malocclusion.	28	32.6

The most commonly known parafunctional habits were thumb sucking (95.3%, n=82), tongue thrusting (81.4%, n=70)), and nail biting (58.1%, n=50). The most commonly known malocclusion was open bite (45.3%, n=39) with 41.9% (n=36) unable to identify any. Notably, 83.7% (n=72) had not received any training on parafunctional habits, and all respondents (100%) had not received training on orthodontic problems in children. When asked about recommended methods to receive such training, 52.3% (n=45) suggested doing so during medical school, 24.4% (n=21) during specialization, and 23.3% (n=20) through workshops

Table VII; Identification of parafunctional oral habits and malocclusions and training

Variable (N=86)	Frequency	Percentage
Parafunctional habits you know and can identify		
Thumb sucking	82	95.3
Lip biting	32	37.2
Tongue thrusting	70	81.4
Nail biting	50	58.1
Mouth breathing	26	30.2
Clenching of teeth	18	20.9
None	1	1.2
Manifestations of malocclusions you can identify		
Open bite	39	45.3
Deep bite	10	11.6
Crowding	20	23.3
Reverse bite	10	11.6
Increased overjet	3	3.5
None	36	41.9
Have you received any training on parafunctional habits (bad oral habits) and approaches to be applied in children?		
No	72	83.7

Yes, during medical school education.	11	12.8
Yes, during specialization.	3	3.5
Have you received any training on orthodontic problems in children and the approaches to be applied?		
No	86	100
Yes, during medical school education.	0	0
Yes, during specialization.	0	0
What methods to receive education and training on parafunctional oral habits and malocclusions would you recommend?		
Workshops	20	23.3
During medical school	45	52.3
During specialization	21	24.4

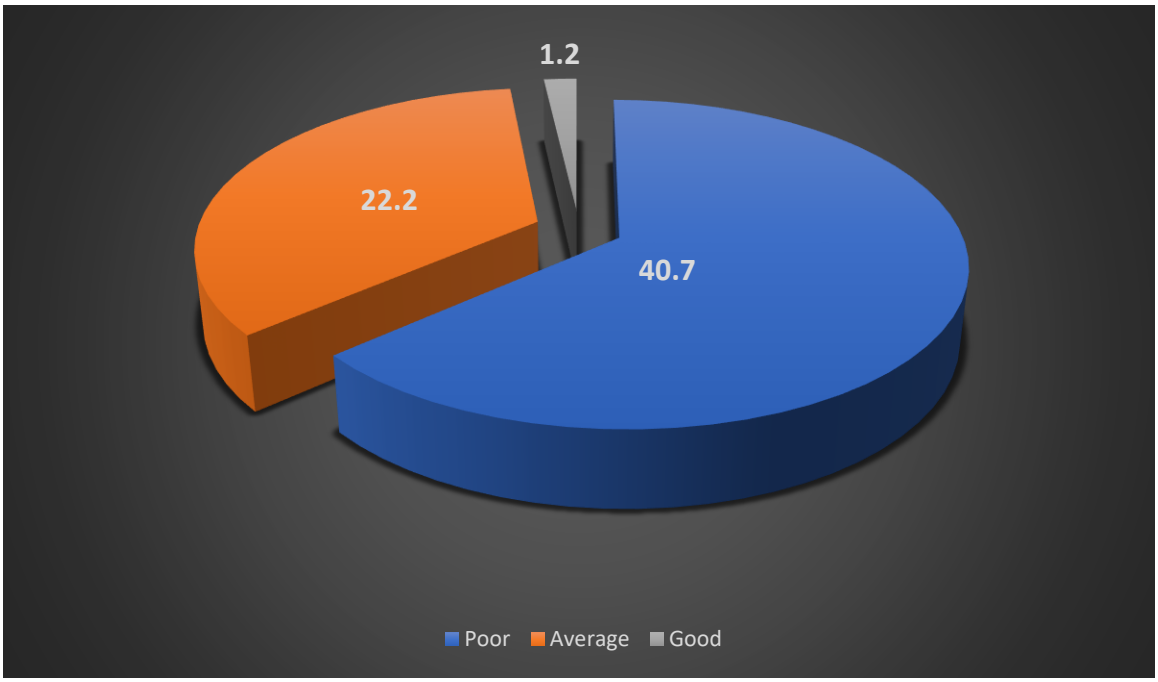


Fig 7: Knowledge of participants

40.7% of our participants had poor knowledge while 22.2% were average.

IV.4. RESULTS ON ATTITUDE TOWARDS PARAFUNCTIONAL HABITS AND MALOCCLUSIONS

98.8% (n=85) of our respondents believe that paediatricians have to examine the oral cavity, and the same percentage also believe that dental malocclusions can be prevented. Additionally, 97.7% (n=84) of respondents indicated that dental examination is important in the prevention of parafunctional oral habits and malocclusions. 96.5% (n=83) of the respondents agreed that paediatricians play an important role in identifying and diagnosing parafunctional oral habits and malocclusions in children, while 90.7% (n=78) believe paediatricians have an important part to play in preventing these issues. Table VIII shows information about their attitude.

Notably,100% (n=86) of our respondents stated that they need more education on parafunctional habits and malocclusion prevention..

Table VIII; Distribution according to attitude

Variable (N=86)	Frequency	Percentage
Pediatricians have to examine the oral cavity.	85	98.8
Dental malocclusions can be prevented.	85	98.8
Dental examination is important in the prevention of parafunctional oral habits and malocclusions.	84	97.7
Pediatricians play an important role in the pointing out and diagnosing of parafunctional oral habits and malocclusions in children.	83	96.5
Pediatricians play an important role in the prevention of parafunctional oral habits and malocclusion in children.	78	90.7
I need more education on parafunctional habits and malocclusion prevention.	86	100

No respondents (0%) scored in the Poor range. The vast majority, 84 respondents or 97.7%, achieved a Good score.

IV.5. PRACTICE

According to our results, 76.7% (n=66) of respondents evaluate the oral functional habits of their patients. Only 10.5% (n=9) perform oral health examinations for malocclusion. Regarding the timing of the first oral health examination, 12.8% (n=11) do it immediately after birth, 37.7% (n=32) do it between 0-3 years, and 11.6% n=10) do it at 3 years or older. In terms of frequency, 47.7% (n=41) recommend oral health examinations only if there is a problem. Finally, 53.5% (n=46) refer patients to a pediatric dentist when they notice parafunctional oral habits or malocclusion.

Table IX; Practice

Variable (N=86)	Frequency	Percentage
You evaluate the oral functional habits of your patients?	66	76.7
You perform oral health examinations for malocclusion for your patients.	9	10.5
When do you perform the first oral health examination for your patients?		
I don't	33	38.4
Immediately after birth	11	12.8
0-3 years	32	37.7
>=3 years	10	11.6
When would you recommend the first oral health examination to your patients?		
Immediately after birth	17	19.8
0-3 years	62	72.1
>=3 years	7	8.1
How often do you recommend oral health examination?		
If any problem	41	47.7
Per 6 months	7	8.1

Per year	25	29.1
You refer your patient to a pediatric dentist when you notice any parafunctional oral habit or malocclusion	46	53.5

Of the 46 who refer patients, 60.9% (n=28) do it by advising families to visit the pediatric dentist, 36.9% (n=17) send them with a referral form and 2.2% (n=1) work directly with the pediatric dentist. On the other hand, only 60.9% (n=28) check if the visit was done.

Table X; Distribution according to referral methods

Variable (N=46)	Frequency	Percentage
If your answer to the previous question is yes, how do you do the referral?		
I advise families to go to a pediatric dentist.	28	60.9
I send them with a referral form to the pediatric dentist.	17	36.9
I work directly with the pediatric dentist	1	2.2
When your patient, whom you referred to the pediatric dentist comes to you for a check- up, you check whether the pediatric dentist examination is performed.	28	60.9

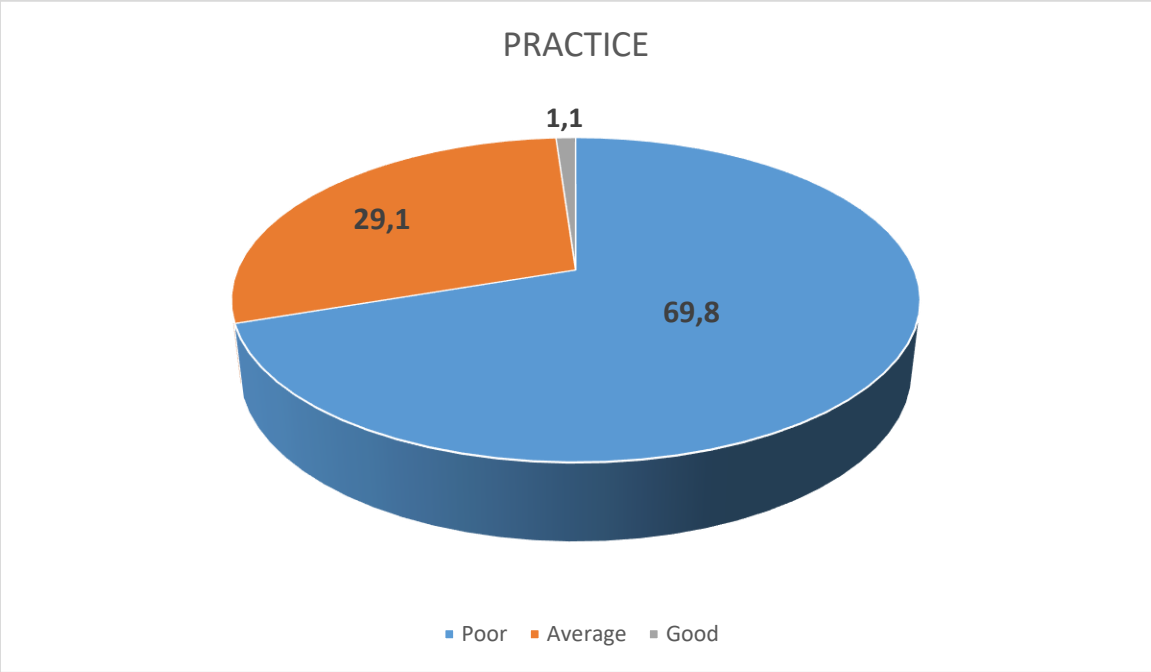


Fig 8: Practice of participants

60 individuals or 69.8%, scored in the Poor range while a significant portion, 25 respondents or 29.1%, scored in the Average range. Only 1.1% of the total, achieved a Good score of over 80.

.

Chapter V; DISCUSSION

The aim of our study was to determine the knowledge, attitude and practice of pediatricians in Cameroon towards parafunctional oral habits and dental malocclusions. Out of the 159 pediatricinas we approached, 86 were retained giving a response rate of 54.09%

LIMITATIONS OF STUDY

- Our response rate was relatively low; probably due to the fact that our questionnaire was mostly administered online.

- Not all regions in Cameroon were represented.

- Pediatricians are not the only healthcare providers who work with children.

- Lastly, due to the self-reporting aspect of the study, we could not determine whether reported practices reflected actual clinical practices, so it is possible that respondents may over- or under report attitude and practice.

STRENGTHS

- A major percentage of our sample live in the urban setting where there is relatively higher exposure.

- Eight out of the ten regions of Cameroon were represented which made it fairly representative.

5.1 SOCIO-PROFESSIONAL DATA

In our study, 69.8% of the respondents were female. These results are similar to those of *Marianna et al* in 2019 in Greece where 67% of their respondents were female [39]. This could be explained by the fact that women have a relatively higher affinity for children than men which makes more women to go in for this specialty than men. Also, 51.2% of our respondents were between the ages of 40-49 years old.

53.5% reported consulting over 10 patients a day. This could be a contributing factor to them not carrying out oral examinations because of limited time.

45.3% and 38.4% of our participants were from the Centre and Littoral regions respectively with the other regions making up smaller percentages. This is probably due to the higher population

density in these regions. Also, the fact that the older faculties of medicine are found in these regions could explain the higher population of physicians in these regions.

With regards to years of clinical practice,50.0% had 10-19 years of experience and 77.1% of the sample spend 40 or more hours in patient care per week. This can be explained by the relatively high pediatrician-patient ratio which makes it necessary for them to work long hours.

5.2 KNOWLEDGE

43% of respondents reported having knowledge that children with parafunctional oral habits are more likely to develop malocclusion, and 52.3% knew that thumb sucking increases the risk of malocclusion. These results are similar to those of *Kumar et al* in India where 56% of the respondents were aware of oral habits and 55% were aware of the adverse effects of thumb sucking on dentition [1].

Also, in our study, 18.6% of respondents indicated that long-term bottle feeding increases the possibility of malocclusion. These are significantly different from *Kumar et al*'s results where 86.1% had knowledge regarding the fact that long-term feeding of breast milk or formula with a bottle increases the likelihood of parafunctional oral habit and malocclusion [1].

Only 2.3% of respondents believed that children with snoring/breathing problems are more prone to crowding. 51.2% knew that prolonged pacifier use increases the risk of open-bite. Regarding the impact of supporting healthy chewing/swallowing, 43% said it can help prevent malocclusion and 9.3% reported that nail biting increases the risk of malocclusion. On the contrary, *Maden et al* had different results. 81.5% of the participants had sufficient knowledge regarding the fact that if the duration of pacifier use is prolonged, the possibility of open-bite increases and 71.7% of the participants answered the question that supporting healthy chewing function in early childhood can help to prevent malocclusion correctly. For the possibility of malocclusion in children with snoring and respiratory problems (mouth breathing), 71.7% of the participants answered this question correctly [5]. This difference might be related to the lack of required dental training and education of the majority of our participants.

Our respondents have an overall insufficient knowledge of parafunctional habits and malocclusions which could be explained by the fact that the field of dental medicine is relatively recent in our context.

In our study, 83.7% had not received any training on parafunctional habits, and 100% had not received training on orthodontic problems in children. This is similar to the results obtained by *Sezer et al* in 2013 where 89.2% reported having no training on oral health during residency and/or medical school [41] . This could be justified by the fact that dental courses have not fully been integrated in the curriculum of their training.

However, we can infere that the percentage of our participants who were able to identify malocclusions or parafunctional habits got the information through other means or through interactions with dentists given that most had not received any formal training on the subject.

5.3 ATTITUDE

98.8% of our respondents believe that pediatricians have to examine the oral cavity, and the same percentage also believe that dental malocclusions can be prevented. Additionally, 97.7% of respondents indicated that dental examination is important in the prevention of parafunctional oral habits and malocclusions. 96.5%of the respondents agreed that pediatricians play an important role in identifying and diagnosing parafunctional oral habits and malocclusions in children. *Farsi et al* had very similar results during their study in Jeddah where a vast majority of pediatricians portrayed an overall good attitude towards oral health [42].

The high attitude scores in our study implied that majority of our respondents acknowledge their role in diagnosing and managing parafunctional oral habits and malocclusions.

5.4 PRACTICE

According to our results, 76.7% of respondents evaluate the functional habits of their patients. Regarding the timing of the first oral health examination, 38.4% don't remember to do it. In a national survey with post-residency members of the American Academy of Pediatrics, 54%

claimed to examine the teeth of their 0–3year-old patients [43]. Lack of training was the most common reason for not performing an oral examination which applies in our context.

Demir *et al* found out that 19.3% of pediatricians in their study in Turkey don't perform the first oral examination [40].

In terms of frequency, 8.1% recommend oral health examinations every 6 months. Finally, 53.5% refer patients to a pediatric dentist when they notice parafunctional oral habits or malocclusion. These results are contrary to those of Maden *et al* where regarding how often an oral health examination was recommended, 49.4% of the participants indicated it as six months. Moreover, 97.6% said they would refer a child to pediatric dentists when they identified a child with malocclusion or any parafunctional habits [5]. This is somehow contradictory to the lower knowledge scores and their response to oral examination so we would assume that they notice these parafunctional habits without actually seeking them out.

In our study, practice scores were quite poor indicating no discrepancy with the knowledge scores and still could be justified by their relative lack of training in the field of dentistry.

Chapter VI: CONCLUSION and RECOMMENDATIONS

CONCLUSION

The purpose of this study was to assess the knowledge, attitude and practice of pediatricians regarding parafunctional oral habits and dental malocclusions in children. A cross sectional study was conducted among 86 pediatricians in Cameroon. The results showed that;

Pediatricians had poor knowledge regarding parafunctional oral habits and dental malocclusions in children. They could however identify certain parafunctional habits but had little knowledge regarding its effect on the developing dentition.

Pediatricians had a good attitude towards the subject. This was likely due to the fact that they had received little or no training in parafunctional oral habits and dental malocclusions.

Pediatricians practice regarding parafunctional oral habits and dental malocclusions was equally poor for a majority and average for a few.

RECOMMENDATIONS

To pediatricians

To actively take part in trainings in the domain of parafunctional oral habits and dental malocclusions.

To do personal studies on the subject.

To pediatric and dental associations

To organize joint seminars inorder to foster collaboration between both fields.

To researchers

To carry out related studies on a larger scale.

To the Faculty of Medicine and Biomedical Sciences

To organize seminars, workshops and conferences to train students on parafunctional habits and dental malocclusions.

To include courses on this subject in the curriculum of general medicine and specialization in pediatrics.

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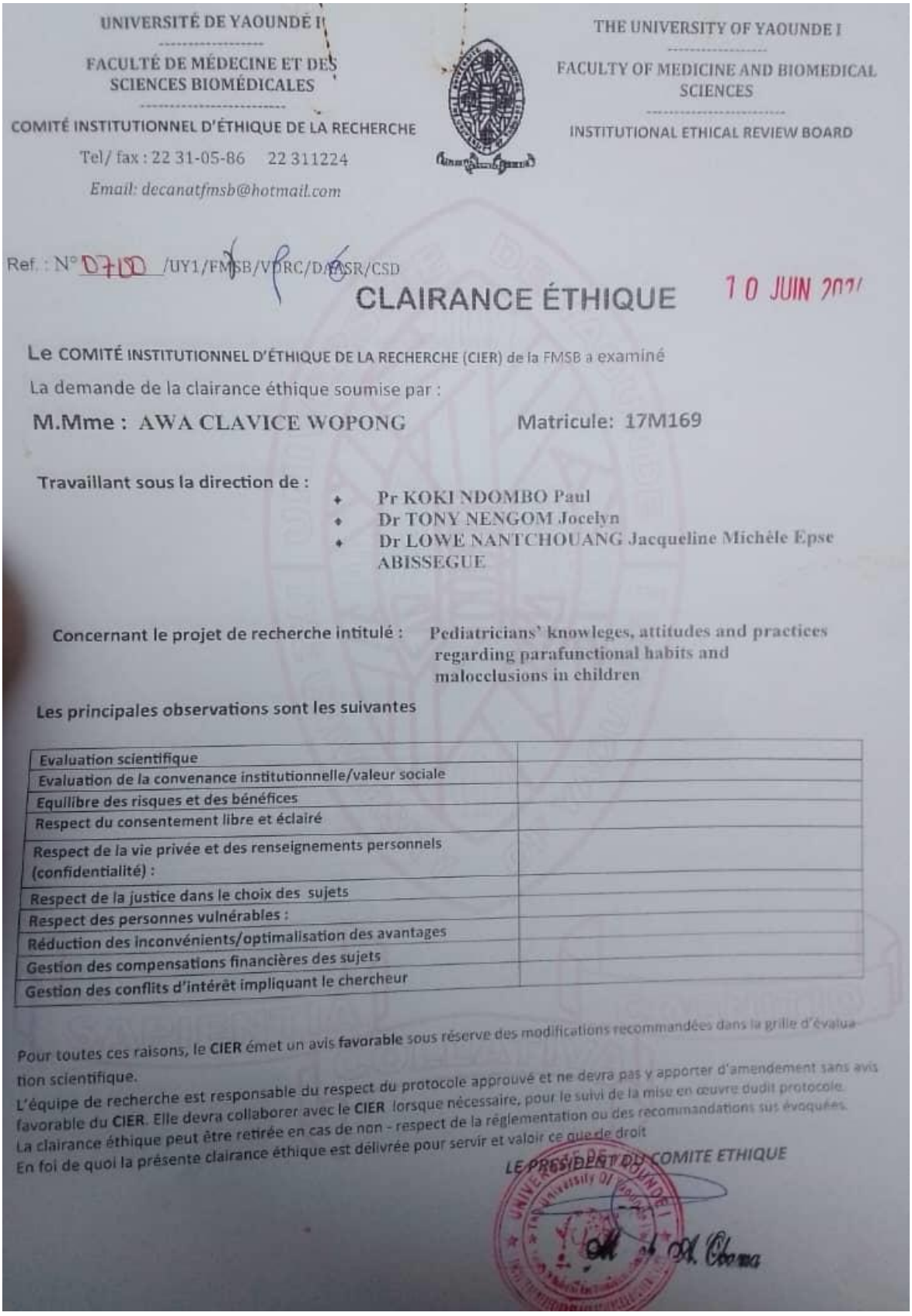
APPENDIX



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THE UNIVERSITY OF YAOUNDE I

FACULTY OF MEDICINE AND BIOMEDICAL SCIENCES

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CLAIRANCE ÉTHIQUE

10 JUIN 2021

Le COMITÉ INSTITUTIONNEL D'ÉTHIQUE DE LA RECHERCHE (CIER) de la FMSB a examiné

La demande de la clairance éthique soumise par :

M.Mme : AWA CLAVICE WOPONG Matricule: 17M169

Travaillant sous la direction de :

- Pr KOKI NDOMBO Paul
- Dr TONY NENGOM Jocelyn
- Dr LOWE NANTCHOUANG Jacqueline Michèle Epse ABISSEGUE

Concernant le projet de recherche intitulé : Pediatricians' knowleges, attitudes and practices regarding parafunctional habits and malocclusions in children

Les principales observations sont les suivantes

Evaluation scientifique	
Evaluation de la convenance institutionnelle/valeur sociale	
Equilibre des risques et des bénéfices	
Respect du consentement libre et éclairé	
Respect de la vie privée et des renseignements personnels (confidentialité) :	
Respect de la justice dans le choix des sujets	
Respect des personnes vulnérables :	
Réduction des inconvénients/optimalisation des avantages	
Gestion des compensations financières des sujets	
Gestion des conflits d'intérêt impliquant le chercheur	

Pour toutes ces raisons, le CIER émet un avis favorable sous réserve des modifications recommandées dans la grille d'évaluation scientifique.

L'équipe de recherche est responsable du respect du protocole approuvé et ne devra pas y apporter d'amendement sans avis favorable du CIER. Elle devra collaborer avec le CIER lorsque nécessaire, pour le suivi de la mise en œuvre dudit protocole.

La clairance éthique peut être retirée en cas de non - respect de la réglementation ou des recommandations sus évoquées.

En foi de quoi la présente clairance éthique est délivrée pour servir et valoir ce que de droit

LE PRÉSIDENT DU COMITE ETHIQUE

Questionnaire

KNOWLEDGE, ATTITUDES AND PRACTICES OF PEDIATRICIANS TOWARDS PARAFUNCTIONAL ORAL HABITS AND DENTAL MALOCCLUSIONS IN CHILDREN

No	Question	Answer	Score
	SOCIODEMOGRAPHIC DATA		
1	Age	30-39 40-49 50+	
2	Gender	Male Female	
3	Subspecialty	Yes No	
4	Years of clinical experience	0-9 10-19 20+	
5	Type of practice	Government Hospital Private Hospital Both	
6	Hours of patient care per week	<40 >=40	
7	Number of patients seen per day	<=10 10-19	

		20-29	
8	Region of practice	North West South West Centre Littoral East West Far North North Adamawa South	
KNOWLEDGE			
9	Children with parafunctional oral habits are more likely to develop malocclusion. Do you have any information about this?	Yes No	
10	Long-term feeding of breast milk or formula with a bottle increases the possibility of developing parafunctional oral habits and malocclusion. Do you have any information about this?	Yes No	
11	Children with snoring and breathing problems (mouth breathing) are more prone to crowding. Do you have any information about this?	Yes No	

12	If the pacifier use time is prolonged, the possibility of open-bite increases. Do you have any information about this?	Yes No	
13	Supporting healthy chewing and swallowing function in early childhood can help prevent malocclusion. Do you have any information about this?	Yes No	
14	Nail biting or Onycophagia increases the risk of malocclusion. Do you have any information about this?	Yes No	
15	Thumb sucking increases the risk of malocclusion. Do you have any information about this?	Yes No	
16	Tongue-sucking increases the risk of malocclusion. Do you have any information about this?	Yes No	
17	Which of the following parafunctional habits do you know and can identify? (Multiple answers)	Thumb sucking Lip biting Tongue thrusting Nail biting Mouth breathing Clenching of teeth	

18	Which of the following manifestations of malocclusions can you identify? (multiple answers)	Open bite Deep bite Crowding Reverse bite Increased Overjet None	
19	Have you received any training on parafunctional habits (bad oral habits) and approaches to be applied in children?	No Yes, I got it in my medical education Yes, I got it in my specialist training	
20	Have you received any training on orthodontic problems in children and the approaches to be applied?	No Yes, I got it in my medical school training Yes, I got it in my specialist training	
ATTITUDE			
21	Pediatricians have to examine the oral cavity.	Yes No	
22	Dental malocclusions can be prevented.	Yes	

		No	
23	Dental examination is important in the prevention of parafunctional oral habits and malocclusions.	Yes No	
24	Pediatricians play an important role in the pointing out and diagnosing of parafunctional oral habits and malocclusions in children.	Yes No	
25	Pediatricians play an important role in the prevention of parafunctional oral habits and malocclusion in children.	Yes Non	
26	I need more education on parafunctional habits and malocclusion prevention.	Yes Non	
27	If your previous answer is yes, what methods to receive education and training on parafunctional oral habits and malocclusions would you prefer?	Workshops and colleagues During medical school During specialisation	
PRACTICE			
28	Do you evaluate the functional habits of your patients?	No Yes	

29	Do you perform oral health examinations for malocclusion for your patients?	Yes No	
30	When do you perform the first oral health examination for your patients?	I don't Immediately after birth 0-3 years >=3 years	
31	When would you recommend the first oral health examination to your patients?	Immediately after birth 0-3 years >=3 years	
32	How often do you recommend oral health examination?	If any problem per 6 months per year I don't	
33	Do you refer your patient to a pediatric dentist when you notice any parafunctional oral habit or malocclusion?	Yes No	
34	If your answer to the previous question is yes, how do you do the referral? (multiple answers possible)	I advise families to go to a pediatric dentist. I send them with a referral form to the pediatric dentist. I work directly with the pediatric dentist by giving information myself.	

35	When your patient, whom you referred to the pediatric dentist comes to you for a check-up, do you check whether the pediatric dentist examination is performed?	Yes No	

Questionnaire

CONNAISSANCES, ATTITUDES ET PRATIQUES DES PÉDIATRES À L'ÉGARD DES HABITUDES BUCCALES PARAFONCTIONNELLES ET DES MALOCCLUSIONS DENTAIRES CHEZ L'ENFANT

No	Question	Reponse	Note
	DONNÉES SOCIO-PROFESSIONNELLES		
1	Âge	30-39 40-49 50+	
2	Genre	Mâle Femelle	
3	Souspécialité	Yes No	
4	Années d'expérience clinique	0-9 10-19 20+	
5	Lieu de pratique	Hopital public	

		Hopital prive Les deux	
6	Heures de soins aux patients par semaine	<40 >=40	
7	Nombre de patients vus par jour	<=10 10-19 20-29	
8	Région de pratique	Nord Ouest Sud-Ouest Centre Littoral Est Ouest Extrème nord Nord Adamaoua Sud	
	Section II ; CONNAISSANCES		
9	Les enfants ayant des habitudes buccales parafonctionnelles sont plus susceptibles de développer une malocclusion. Avez-vous des informations à ce sujet ?	Oui Non	

10	L'alimentation à long terme avec du lait maternel ou du lait maternisé au biberon augmente la possibilité de développer des habitudes buccales parafonctionnelles et une malocclusion. Avez-vous des informations à ce sujet ?	Oui Non	
11	Les enfants souffrant de ronflements et de problèmes respiratoires (respiration buccale) sont plus sujets à la promiscuité. Avez-vous des informations à ce sujet ?	Oui Non	
12	Si la durée d'utilisation de la tetine est prolongée, la possibilité de béance augmente. Avez-vous des informations à ce sujet ?	Oui Non	
13	Soutenir une fonction saine de mastication et de déglutition dès la petite enfance peut aider à prévenir les malocclusions. Avez-vous des informations à ce sujet ?	Oui Non	
14	Le rongement des ongles ou Onycophagie augmente le risque de malocclusion. Avez-vous des informations à ce sujet ?	Oui Non	
15	La succion du pouce augmente le risque de malocclusion. Avez-vous des informations à ce sujet ?	Oui Non	
16	La succion de la langue augmente le risque de malocclusion. Avez-vous des informations à ce sujet ?	Oui Non	

17	Parmi les habitudes parafonctionnelles suivantes, lesquelles connaissez-vous et pouvez-vous identifier ? (Plusieurs réponses)	Succion du pouce Succion de la langue Rongement des ongles Respiration buccale grincement des dents Aucun	
18	Parmi les manifestations suivantes de malocclusions, lesquelles pouvez-vous identifier ? (plusieurs réponses)	Béance Encombrement Occlusion inversée Augmentation du surplomb Aucun	
19	Avez-vous reçu une formation sur les habitudes parafonctionnelles chez les enfants et les approches à appliquer ?	Non Oui, je l'ai obtenu lors de ma formation en médecine Oui, je l'ai obtenu dans ma spécialisation	

20	Avez-vous reçu une formation sur les problèmes orthodontiques chez les enfants et les approches à appliquer ?	Non Oui, je l'ai obtenu lors de ma formation en médecine Oui, je l'ai obtenu dans ma spécialisation	
21	Quelles méthodes préféreriez-vous pour recevoir une éducation et une formation sur les habitudes buccales parafonctionnelles et les malocclusions ?	• Ateliers et collègues • Pendant les études de médecine • Pendant la spécialisation	
	ATTITUDE		
22	Les pédiatres doivent examiner la cavité buccale.	Oui Non	
23	Les malocclusions dentaires peuvent être évitées.	Oui Non	
24	L'examen dentaire est important dans la prévention des habitudes buccales parafonctionnelles et des malocclusions.	Oui Non	

25	Les pédiatres jouent un rôle important dans la détection et le diagnostic des habitudes buccales parafonctionnelles et des malocclusions chez les enfants.	Oui Non	
26	Les pédiatres jouent un rôle important dans la prévention des habitudes buccales parafonctionnelles et des malocclusions chez les enfants.	Oui Non	
27	J'ai besoin de plus d'éducation sur les habitudes parafonctionnelles et la prévention des malocclusions.	Oui Non	
	PRATIQUES		
28	Évaluez-vous les habitudes fonctionnelles de vos patients ?	Non Oui	
29	Effectuez-vous des examens de santé bucco-dentaire pour détecter une malocclusion chez vos patients ?	Oui Non	
30	Quand effectuez-vous le premier examen de santé bucco-dentaire de vos patients ? •	Je ne le fais pas Immédiatement après la naissance 0-3 ans >=3 ans	

31	Quand recommanderiez-vous le premier examen de santé bucco-dentaire à vos patients ?	Immédiatement après la naissance 0-3 ans >=3 years	
32	À quelle fréquence recommandez-vous un examen de santé bucco-dentaire ?	En cas de probleme Tout les 6 mois Par an Je ne le fais pas	
33	Orientez-vous votre patient vers un dentiste pédiatrique lorsque vous constatez une habitude buccale parafonctionnelle ou une malocclusion ?	Oui Non	
34	Si votre réponse à la question précédente est oui, comment procédez-vous au référencement ? (plusieurs réponses possibles)	Je conseille aux familles d'aller chez un pedodontiste Je les envoie avec un formulaire de référence au pedodontiste pédiatrique. Je travaille directement avec le pedodontiste en	

		donnant moi-même les informations.	
35	Lorsque votre patient, que vous avez adressé au dentiste pédiatrique, vient chez vous pour un contrôle, vérifiez-vous si l'examen du dentiste pédiatrique a été effectué ?	Oui Non	

ANTI-PLAGIARISM REPORT

PEDIATRICIANS' KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS PARAFUNCTIONAL ORAL HABITS AND DENTAL MALOCCLUSIONS IN CHILDREN

ABSTRACT

Introduction. The World Health Organization (WHO) considers malocclusion as one of the most important oral health problems, after caries and periodontal disease. Its prevalence is highly variable and is estimated to be between 39% and 93% in children and adolescents. Parafunctional habits are abnormal hyperactive functions conducted by the masticatory structures, i.e. tongue, teeth, oral muscles, and so on. They include thumb sucking, tongue thrusting, bruxism, prolonged use of feeding bottle or pacifier and so on. Parafunctional habits happen to be a major risk factor for malocclusion. Adequate knowledge of pediatricians and their collaboration with oral healthcare providers would go a long way into sensitizing patients on parafunctional habits and their effect on the developing dentition, as well as intercepting malocclusions at an early stage where they can be corrected through referrals to orthodontists or pediatric dentists

Objective. Our objective was to evaluate the knowledge, attitude and practice of paediatricians in Cameroon towards parafunctional oral habits and dental malocclusions in children.

Materials and Methods. A descriptive, cross-sectional survey was sent to a sample of pediatricians in Cameroon. The questionnaire consisted of 35 questions in four domains; socioprofessional information, knowledge, attitude and practice.

Results. A total of 86 pediatricians participated in the survey. In terms of knowledge, 43% of respondents reported having knowledge that children with parafunctional oral habits are more likely to develop malocclusion. Regarding their attitude, 97.7% of respondents had a good attitude towards the subject. In terms of examination of the oral cavity, a low frequency of examination amongst pediatricians for malocclusion (10.5%) and oral functional habits (76.7%) was detected. 47.7% recommend oral health examinations only if there is a problem and 53.5% refer patients to a pediatric dentists when they notice any abnormality.

Conclusion. Although a vast majority of the paediatricians in our survey recognised their place in identifying and preventing parafunctions and malocclusions, very few have adequate knowledge and skills to perform evaluations and referrals.

Key words: *Pediatricians, knowledge, attitude, practice, parafunctions, malocclusion*

CHAPTER I: INTRODUCTION

I.1 BACKGROUND

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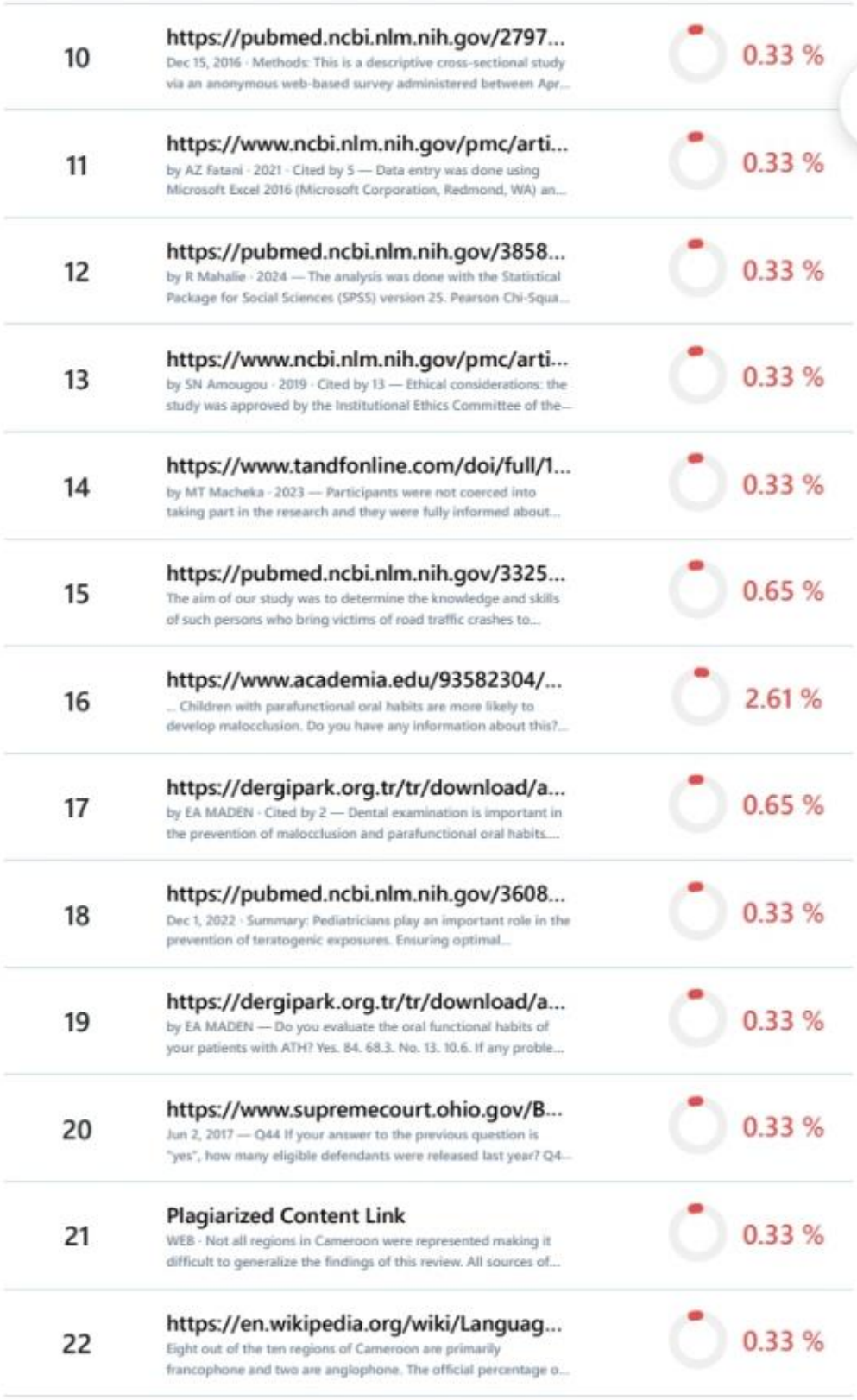

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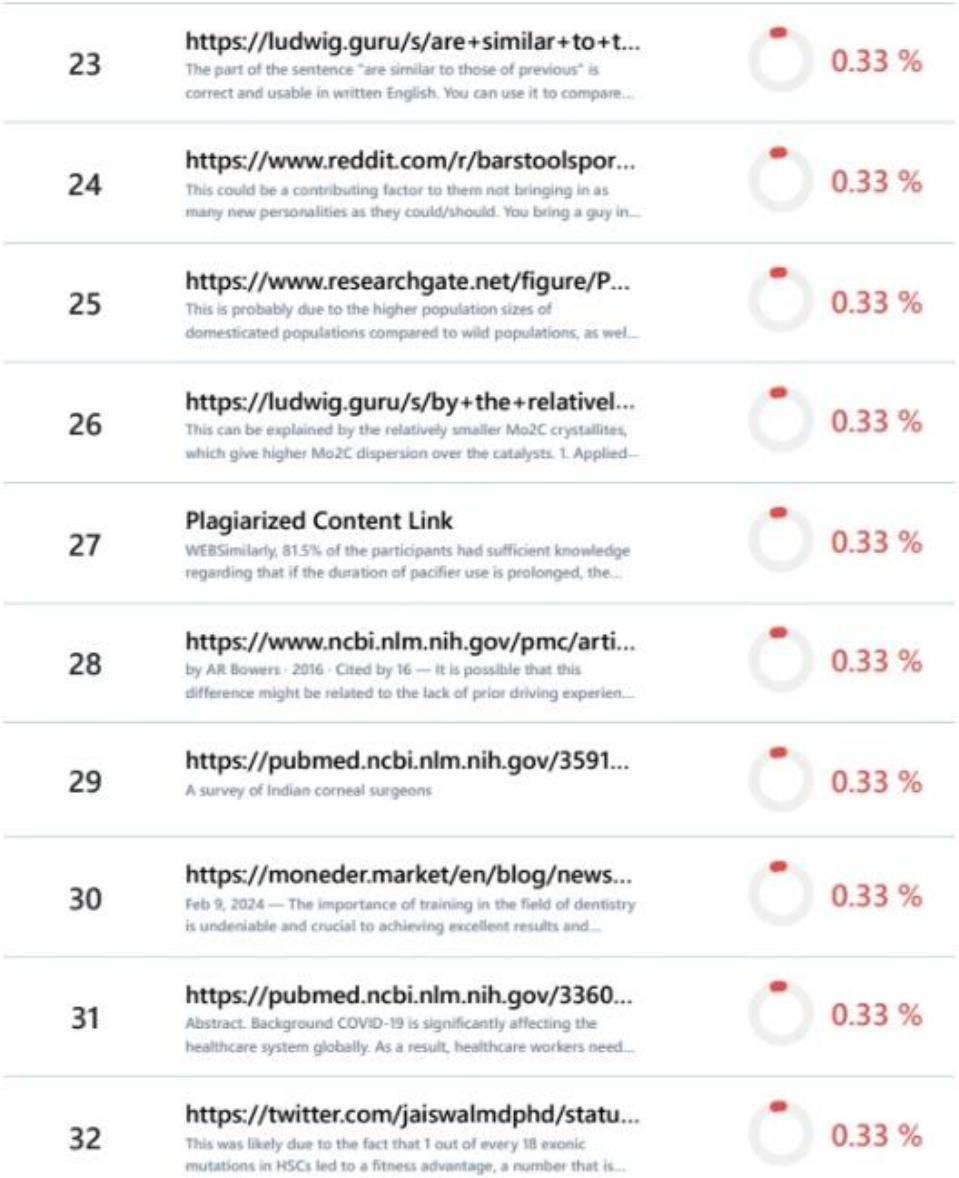

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