International Journal of Advanced Research in Dental and Medical Sciences (IJARDMS)
www.ijardms.com
Volume 02 Issue 01 ǁ 2023 ǁ PP. 09-18

Influence of the mass index body on the eruption of the first and second permanent molars

Influence de l'indice de masse corporelle sur l'éruption des premières et deuxièmes molaires permanentes

Moneboulou Mengong HP[1], Ndjoh JJ[1], Zing Salomon[1], YufenyuY W P[1], Bengondo Charles[1]

[1]Faculté de Médecine et des Sciences Biomédicales, Université de Yaoundé1, Cameroun1
Faculty of Medicine and Biomedical Sciences, University of Yaoundé1, Cameroon

Abstract:
Background: The eruption of teeth, chronologies of human dentition, dental age and tooth formation standards are important aspects applied to dental practice. Body mass index (BMI) on the other hand, gives an indication of the nutritional status of a child. Therefore, it is relevant to know if BMI influenced tooth eruption patterns of permanent first and second molars. We will determine the age of eruption of the first and second permanent molars and compare with the body mass index in a group of children from selected schools.
Materials and methods: We conducted a cross-sectional study on 644 children aged 3 to 15 years. They were classified in Five body mass index groups. Their weights were measured with a standard scale unit in Kilogram. Height was measured with a standiometer graduated in centimeters. The BMI was calculated by dividing the weight (Kg) by the square of the height (m) to obtain a value expressed in Kilogram per square meter (Kg/m2). Values of BMI were correlated with that of the CDC growth chart for be able to tell if the child is underweight, normal weight, overweight and obese. The intraoral examination was made using a mirror. The independent t-test allowed the comparison between ages rash averages.
Results: Of 644 children, 357 (55.4%) were girls with a ratio woman: man of 1.2. The minimum eruption age for the boys was 3 years old, the age maximum 15 years old with average age of (M=5.75±1.212) for the first molar, M=12.30±0.921 for the second molar

The minimum and maximum age for girls was respectively 3 and 14 years with an average age of eruption and SD (standard deviation) M = 6.08 ± 0.973 for the first molar and M=12.18±0.804 for the second molar. The average ages were 5.6 years for the first permanent molar and 11.9 years for the second permanent molar with an interval of 95% confidence. The average ages of the first and second permanent molars have was statistically significant (p=0.00) with body mass index
Conclusion: Girls had and earlier eruption time. The mean age of eruption was 5.6years for the first permanent molars and 11.9 years for the second. We found influence of BMI on eruption of permanent first and second molars.
Keywords: Age of eruption, BMI, children, permanent first and second molars

Résumé:
Contexte: L'éruption des dents, les chronologies de la dentition humaine, l'âge dentaire et les normes de formation des dents sont des aspects importants appliqués à la pratique dentaire. L'indice de masse corporelle (IMC), quant à lui, donne une indication de l'état nutritionnel d'un enfant. Par conséquent, il est pertinent de savoir si l'IMC a influencé les schémas d'éruption dentaire des première et deuxième molaires permanentes. Nous déterminerons l'âge d'éruption des premières et deuxièmes molaires permanentes et le comparerons avec l'indice de masse corporelle d'un groupe d'enfants d'écoles sélectionnées.
Matériels et méthodes: Nous avons mené une étude transversale sur 644 enfants âgés de 3 à 15 ans. Ils ont été classés en cinq groupes d'indice de masse corporelle. Leurs poids ont été mesurés avec une unité d'échelle standard en kilogramme. La taille était mesurée avec un standiomètre gradué en centimètres. L'IMC a été calculé en divisant le poids (Kg) par le carré de la taille (m) pour obtenir une valeur exprimée en Kilogramme par mètre carré (Kg/m2). Les valeurs de l'IMC ont été corrélées à celles de la courbe de croissance du CDC pour pouvoir dire si l'enfant est en sous-poids, en poids normal, en surpoids ou obèse. L'examen intra-oral a été réalisé à l'aide d'un miroir. Le test t indépendant a permis la comparaison entre les moyennes des éruptions d'âges.

Résultats: Sur 644 enfants, 357 (55,4%) étaient des filles avec un ratio femme : homme de 1,2. L'âge minimum d'éruption pour les garçons était de 3 ans, l'âge maximum de 15 ans avec un âge moyen de (M=5,75±1,212) pour la première molaire, M=12,30±0,921 pour la deuxième molaire.

L'âge minimum et maximum pour les filles était respectivement de 3 et 14 ans avec un âge moyen d'éruption et SD (écart-type) M = 6,08 ± 0,973 pour la première molaire et M = 12,18 ± 0,804 pour la deuxième molaire. Les âges moyens étaient de 5,6 ans pour la première molaire permanente et de 11,9 ans pour la deuxième molaire permanente avec un intervalle de confiance de 95 %. L'âge moyen des premières et deuxièmes molaires permanentes était statistiquement significatif (p = 0,00) avec l'indice de masse corporelle

Conclusion: Les filles avaient un temps d'éruption précoce. L'âge moyen d'éruption était de 5,6 ans pour les premières molaires permanentes et de 11,9 ans pour les secondes. Nous avons trouvé que l'IMC influence l'age d'éruption des premières et deuxièmes molaires permanentes.

Mots-clés: Âge de l'éruption, IMC, enfants, premières et deuxièmes molaires permanents

Introduction

Tooth eruption is a developmental process starts from the initiation of tooth bud formation from the embryonic cells and continues till complete root development. We can correlate the chronology of teeth eruption with the age of human being and it is an important tool for determining the biological age of human beings in forensic needs when the birth date is not known[1]. Knowledge about the timing of tooth eruption is essential to plan diagnostic, preventive and therapeutic measures[2,3]. Teeth have varied time and sequence of eruption, in clinical studies allover hospitals in Yaoundé, reference values attributed to teeth are based on those obtained from foreign population Studying permanent first and second molars eruption. These is equally important because these teeth determine the oclusal table and affect the position and health of other permanent teeth[3]. Authors suggest in literature writings that, the norms for teeth emergence should come from the population on which the study is to be carried out, as there are variations from one region of the world to another in factors influencing teeth eruption[4]. This is in accordance with studies carried on WAC (Gambian) in 1975 of age range 4.5years to 14years[4,5]. Studies suggest that Caucasians have a delayed time of eruption when compared with other ethnic groups. In addition, Negroes have earlier eruption than Caucasians. Since the end of the nineteenth century, a trend toward earlier eruption of permanent teeth has been reported in industrialized countries. For Almonaitiene et al. in 2010 African children have early eruption of permanent teeth when compared to Caucasian population. Literature accords on the fact that girls have an early tooth eruption when compared to boys[6]. Several factors have been proven to influence tooth eruption in children. These include; BMI, genetic, sex, nutrition, endocrine factors, etc. According to AAPCN, "obesity is the most prevalent chronic health condition in the pediatric population." Obesity is then defined as a BMI greater than or equal to the 95th percentile[6]. We have also, geographical, climatic, racial, gender and ethnic differences, as well as economic status, body constitution, fluoride, season of birth, temporal variations, and growth parameters together with infrequent general pathological conditions, such as endocrine pathology, irradiation. Children who are below average weight and Ages of Permanent First and Second Molar Eruption Among Children in selected schools in Yaoundé height for a specific age show a later eruption time than those children who are within the standard range[5]. In Cameroon, studies have been carried to determine ages of first primary and permanent teeth eruption and none of these evaluated the influence of BMI on permanent first and second molars eruptions. Therefore, the aim is to determine the ages of permanent first and second molar eruption among children in selected schools in Yaoundé and evaluate the influence of BMI on tooth eruption.

I. Material and methods

A descriptive cross-sectional study was carried out in two primary and two secondary schools in Yaoundé for a duration of four months. The following material was used to carry out our work:

Individual report sheet, Consultation trays (Mirror, Probe and Tweezers), latex gloves, surgical masks disinfecting solution, liquid soap, sodium hypochloride solution, Protective glasses, alcoholic solution,

Weight scale, standiometer. Throughout our study, we recruited children whose 1/3 or 2/3 of the crown was visible and/or whose crown was fully visible in the oral cavity. Children whose parents have approved and the children themselves have accepted to participate in the study. Children with chronic systemic pathologies were non-inclued. The Sample Size is calculated using Lorentz formula to estimate the minimum size of the population[7]. Therefore, N = (1.96)2x0.15 (1-0.15)/ (0.05)2=196. Implying a minimum of 196 participants will be required for our study. Absolute precision considered as 5% or 0.05.

The identification of children and collection of demographic data of each child and doubted we calculated the BMI using Quetelet's formula: weight/height2 and expressed in kg/m2 to the nearest one decimal place[7].

- Participant's weight was measured in a standing position. It was expressed to the nearest 0.1KG.
- Participant's height was measured using a standard graduated stadiometer in centimeters.

The values obtained were compared to those stated on the CDC growth chart for children aged 2-19yrs, and these values permitted us to evaluate the nutritional status of the children and be able to say with certitude if the child is underweight, normal or overweight. The CDC defines BMI categories as follows: underweight, BMI less than 5th percentile; normal (average), 5th percentile to less than 85th percentile; overweight, 85th percentile to less than 95th percentile; and obese, 95th percentile or greater. The patients were grouped into either underweight/average or overweight/obese pairings to create a more definitive classification system. Chronologic age was calculated from each child's birth date, and the sex of each patient was also recorded.

An intra-oral examination was done for all the children and all consultations were done using one mouth mirror per child under daylight. The teeth present in the mouth on the day of consultation were noted on the report sheet using the IDF or FDI. A permanent tooth was considered erupted, if part of the crown has emerged out of the oral mucosa into the oral cavity. The administrative bodies of the selected institutions and pupils/students were first sensitized on necessity and proper oral hygiene practices, then explained our objectives for the study before data collection. Consent formulation forms were distributed to teachers to seek their parental approval and it is with the approval of the parents and teachers that an appointment was taken for data collection.

Before carrying out our study, we beseeched an institutional ethical clearance from the ethical committee of FMBS. We also obtained demand for authorization of research from the selected school administrations where the study was to be carried out. AGE: The age of the participants was determined using their date of births as recorded in school documents and in accordance with those giving by the parents.

- sex and place of birth: was determined by looking into his school records
- Teeth eruption chart: After a thorough and scrupulous intra-oral examination, the permanent first and second molars were registered into our report sheet.
- Para-functional exam: It was evaluated by direct and individual inquiry from the participants.

Statistical analysis was done using the statistical package for social sciences (SPSS) version 26.0 and Microsoft excel version 2013. Frequencies and prevalence were expressed in percentages. The level of statistical significance was set at a p-value less than 0.05 and cross tabulations were used to draw tables to compare the variables. The independent t-test was used to compare quantitative and qualitative variables.

II. Results

2.1 Distribution of participants by study site

This study was carried out in four selected schools in Yaoundé of which GENPS Etoug-Ebe had the highest population N=221 (34.3%). GPS Nkolbisson N=198 (30.7), CSHS Obili N =119(18.6), GBHS Etoug-Ebe N= 106 (16.4)

2.2 Demographic characteristics

The study consisted of 644 participants of which 357(55.4%) were females with a sex ratio (F/M) of 1.2 in favor of females and of the 644 participants, 641 (99.5%) were born in Yaoundé.

Table I: Demographic characteristics

Demographic characteristics	Frequency (N=644)	Percentage (%)
Sex		
Males	287	44.6
Females	357	55.4
Place of birth		
Urban	641	99.5
Rural	3	0.

Distribution of participants by gender

Among the 644 participants constituting our population, 55.4% were females with mean age of 11.19±1.272 and 44.6% were males with mean age of 9.14±3.134. Gender ratio (F: M) was 1.2 in favor of females with a confidence interval of 95%

Para-functional examination

In this study, averagely about 98% of the participants had no para-functional habits.

2.3 Age of permanent first molar eruption

Of the 644 participants in this study, 10% of the participants had their first molars already by the age of seven in the first quadrant.

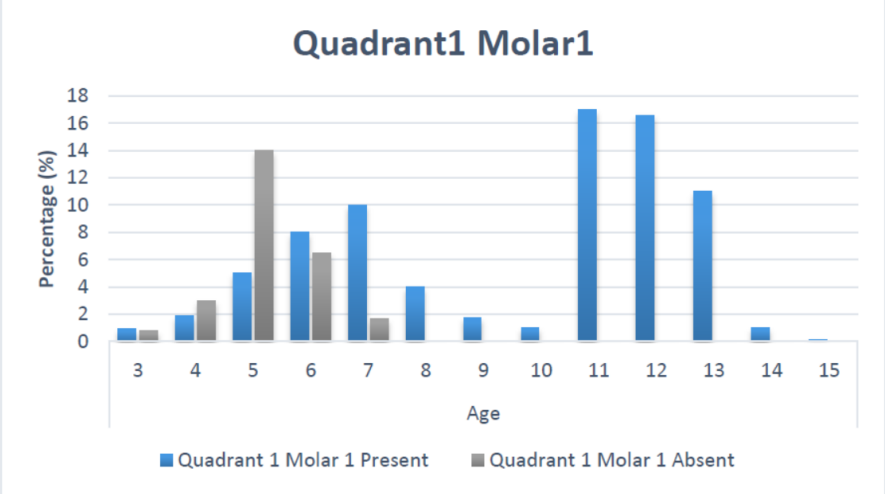

Figure 1: Age and percentage of detection of molar 1 in quadrant1

Age of eruption **of permanent first molar in quadrant two**: In quadrant two, 8% of the participants had their first molars erupted by the age of six.

Age of eruption of **permanent first molar in quadrant three In quadrant three**,

10% of the participants had their first molars erupted at the age of seven.

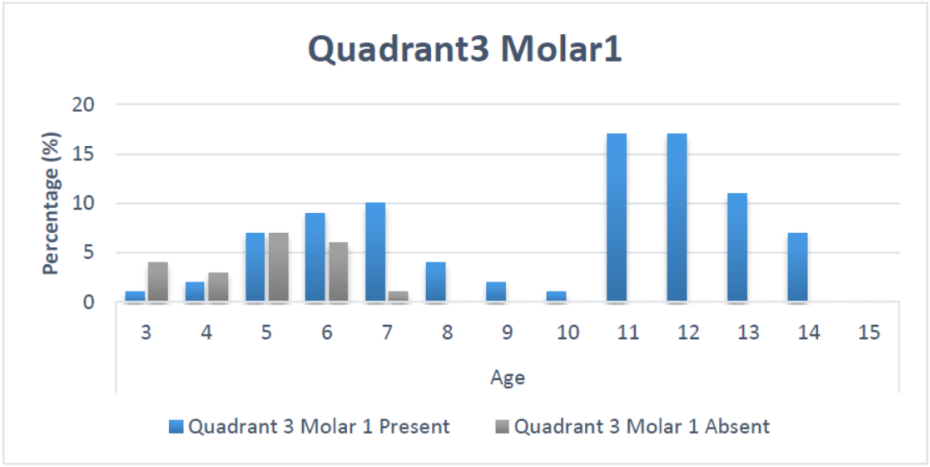

Figure 2: Age and percentage of detection of molar 1 in quadrant 3

Age of eruption of permanent first molar in quadrant four

In quadrant four, 10% of our participants had their first molars erupted by the age of seven.

Age of detection of permanent second molar eruption in quadrant one

From the 644 participants, by the age of twelve 12% of the participants had their second molars erupted in quadrant one.

2.4 Age of eruption of permanent second molar

Age of eruption of permanent second molar in quadrant two

Of all the participants in this study, 10% of the participants had their second molar erupted by the age of thirteen in quadrant two.

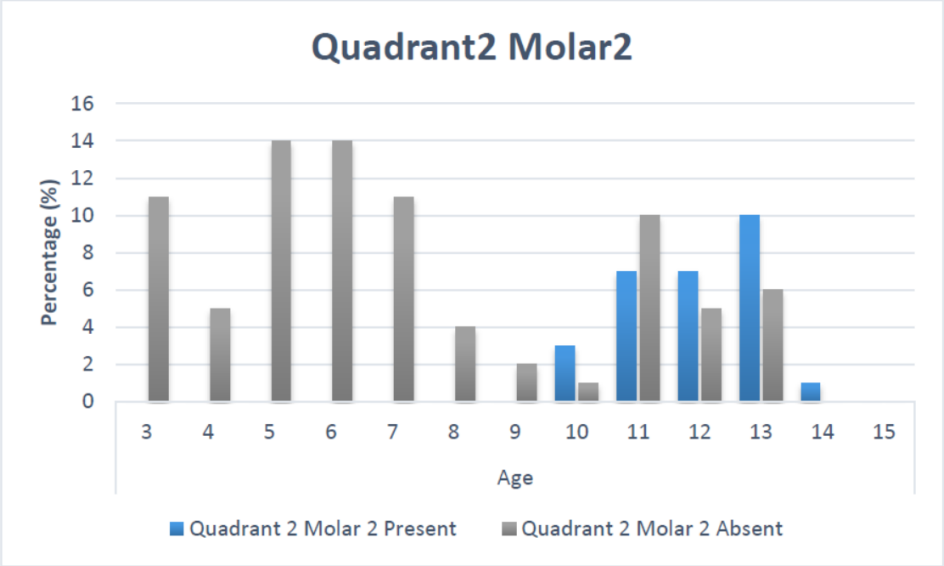

Figure 2. Age and percentage of detection of molar 2 in quadrant

Age of eruption of permanent second molar in quadrant three

Of all the participants, 13% had their second molars erupted by the age of twelve in quadrant three.

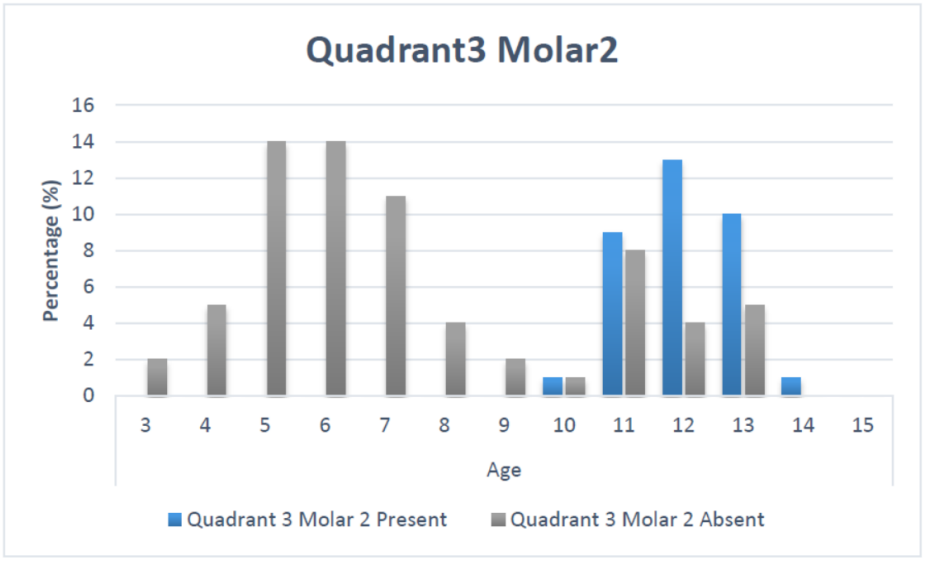

Figure 31: Age and percentage of detection of molar2 in quadrant 3

Age of eruption of permanent second molar in quadrant four

From this study, by the age of twelve, all 10% the participants had their second molars erupted already in quadrant four.

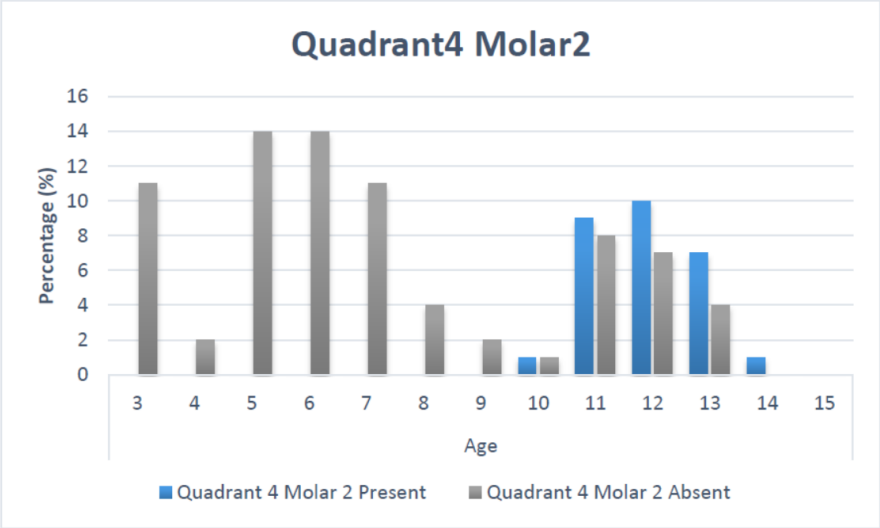

Figure4: Age and percentage of detection of molar 2 in quadrant 4

2.5 Association between BMI and age of molar eruption.

An independent sample t test reported a significant difference in BMI of present and absent for quadrant one molar one, t (326.534) = 12.699, p<0.00, 95% C.I. [1.98837 – 2.71737]. Participants with first molars present were averagely higher (M = 16.3503, SD = 2.58240) as compared to those with first molars absent (M = 13.9975, SD = 1.70845).

Table II: Association between permanent first and second molar eruption and BMI

Quadrant	Molar			Mean	±SD	p-value	t-value	df	CI
Q1	M1	BMI	Present	16.3503	2.58240	0.000	12.699	326.534	1.98837/ 2.71737
			Absent	13.9975	1.70845				
	M2	BMI	Present	17.8881	2.46673	0.000	14.883	337.334	2.58197/ 3.36839
			Absent	14.9129	2.08529				
Q2	M1	BMI	Present	16.3461	2.59797	0.000	12.703	343.392	1.95758/ 2.67487
			Absent	14.0299	1.66246				
	M2	BMI	Present	17.9164	2.46448	0.000	15.062	333.565	2.61655/ 3.40265
			Absent	14.9068	2.07374				
Q3	M1	BMI	Present	16.2774	2.57515	0.000	12.230	247.843	1.99128/ 2.75575
			Absent	13.9038	1.71299				
	M2	BMI	Present	17.7695	2.42542	0.000	15.595	400.522	2.58965/ 3.33675
			Absent	14.8063	2.05223				
Q4	M1	BMI	Present	16.2451	2.58242	0.000	11.852	226.454	1.94724/ 2.72381
			Absent	13.9095	1.70217				
	M2	BMI	Present	17.6607	2.40427	0.000	12.379	642	2.13271/ 2.93689
			Absent	15.1259	2.31917				

Df: degree of freedom C.I: confidence interval

Mean ages of eruption and sd for males and females participants

In this study, the mean age of eruption and SD of permanent first molars eruption was 5.74±1.195 for molar one in quadrant four for males and 5.87±1.073 for molar two in quadrant two in females. The mean age of

eruption for molar two and SD in males was 12.04±1.017 in females quadrant four and 12.07±0.825 for females in quadrant three.

Table III: Showing mean age of eruption of permanent first and second molars and the SD

Quadrant/Molar	Males	Female
	Mean and SD	Mean and SD
Q1M1	5.75 ±1.212	6.08±0.973
Q1M2	12.30±0.921	12.18±0.804
Q2M1	5.79±1.200	6.07±0.980
Q2M2	12.27±0.931	12.17±0.807
Q3M1	5.74±1.215	5.96±0.999
Q3M2	12.20±0.936	12.07±0.825
Q4M1	5.74±1.195	5.87±1.073
Q4M2	12.04±1.017	12.07±0.838

2.6 Comparison between mean age of eruption and SD of the present study and that of other study.

Globally in these study mean age of eruption and SD are earlier than in the other study.

Table IV: Comparison between mean age of eruption and SD of the present study and that of other study.

Quadrant/Molar	Males		female	
	Mean and SD	Present study	Mean and SD	Present study
Q1M1	7.3±4.7	5.75 ±1.212	7.3±4.6	6.08±0.973
Q1M2	13.4±3.7	12.30±0.921	13.4±3.6	12.18±0.804
Q2M1	7.4±5.7	5.79±1.200	7.3±5.7	6.07±0.980
Q2M2	13.4±3.7	12.27±0.931	13.4±3.7	12.17±0.807
Q3M1	6.9±5.1	5.74±1.215	6.9±5.1	5.96±0.999
Q3M2	12.8±4.2	12.20±0.936	12.8±3.9	12.07±0.825
Q4M1	7.0±5.4	5.74±1.195	7.0±5.2	5.87±1.073
Q4M2	12.9±3.8	12.04±1.017	12.8±3.8	12.07±0.838

Frequency of Permanent first and second molars with corresponding BMI groups

This study reported 255(39.6%) with permanent first molars erupted in quadrant four within the BMI group 15.1 – 19Kg/m2 and 57(8.85%) of the participants had second permanent molars erupted in quadrant two within the BMI group 19.1 – 23Kg/m2

Table V: Frequency of permanent first and second molar eruption with BMI

BMI groups (Kg/m2)	Q1M1	Q2M1	Q3M1	Q4M1	Q1M2	Q2M2	Q3M2	Q4M2
8 - 11	1	2	2	2	1	1	1	0
11.1 - 15	189	186	201	206	24	23	28	27
15.1 - 19	245	246	253	255	118	117	137	112
19.1 - 23	64	64	64	64	56	57	56	41
> 23	7	7	7	7	3	3	4	3

III. Discussion

We set out to determine the eruption ages of permanent first and second molars and evaluate the influence of BMI on the eruption of these teeth. The results showed that from the point of view of socio-demographic characteristics, 55.4% of the participants were females, and 99.5% of the participants were born and reside in an urban environment. Our participants ages ranged from 3 to 15years, from which they were grouped in different age groups. This age groups permitted us to evaluate the phenomenon of precocious and retarded eruptions. These age groups were found close to those of Nassif *et al*. 2020[8]. Who conducted a cross-sectional study on timing of eruption of permanent teeth and the clinical emergence. Data were collected for Lebanese children aged between 5.5 years and 13 years from different socioeconomic groups in rural and urban communities spread over different regions in Lebanon[8]**.** Equally this age group was found close to that of Billewicz *et al*. who conducted a similar study on West African (Gambian) children with an age range of 4.5 to 14years[9]**.** We found molar one eruption in quadrant one earlier in males than in females with mean age and SD (M=5.74±1.195) in quadrant while females had an earlier molar two eruption than males in quadrant three (M=12.07± 0.825) which could be explained by early onset of puberty in children which results high metabolic

activities resulting in precocious dental maturation. This is opposed by data obtained from the International Journal of Clinical and Pediatric Dentistry 2020[10]. The 82.9% of our participants had first molar erupted in quadrant four, with the minimum age of 3years for males. The female mean ages of eruption were *M=6.08±0.973* for molar one in quadrant one. Studies have been conducted in many parts of the world to determine ages of permanent first molar eruption. In our study, the first molar was observed within the age group 3 – 7years which was contrary to study conducted by Paolo Frazao *et al*. in 2011 whose lowest age group for first molar emergence was 5.5 – 6years[2]. Our study showed 10% of the participants had all their first molars erupted by the age of seven. However, 0.93% of our participants had first molars erupted by the age 3years which is opposed Nassif *et al*.2020 who suggest that permanent first permanent molar appear around the age of 5 to 6 years[8]**.** This was equally opposed by Jin Yan *et al*. 2021 who suggested that first molar eruption age ranges from 3.5 to 6years[3]. Our chronology for first molar eruption showed that mandibular molars erupted earlier that maxillary first molars which in line with studies conducted by Hassanali *et al*. in Nairobi, Kenya who reported mandibular teeth to erupted earlier than the maxillary ones in both races[11]**.** The present study reported mean age and SD to be *M*=5.62±1.108 with a modal age of 7years. This was opposed by Nassif *et al* 2020[8] whose mean age of eruption and standard deviation for first permanent molar was *M*=6.39±9.69. There was a significantly difference between female mean age of eruptions and SD when compared to male counterparts and when compared to males and females of other studies conducted in other parts of the world. The mean age and SD for females was *M*=5.87±1.073 which was opposed by that of Penmatsa et al 2018 (*M*=6.9±5.1) [12].

3.1 Ages of eruption of permanent second molars

Of all our participants, 35.1% had permanent second molar erupted in quadrant three. The mean ages of eruption of permanent second molars for boys were *M=12.30±0.921* for molar two in quadrant one, *M=12.27±0.931* for molar two in quadrant two, *M=12.20±0.936* for molar two in quadrant three and *M=12.04±1.017* for molar two in quadrant four. For females, the mean ages of eruption were, *M=12.18±0.804* for molar two in quadrant one, *M=12.17±0.807* for molar two in quadrant two, *M=12.07±0825* for molar two in quadrant three, and *M=12.07±0.838* Studies have been conducted on the ages of eruption permanent second molars. This is in line with studies conducted by Ambika *et al*. on Indian school children where 52.56% of the participants were girls with second molars within the range 12 to 13years[13]**.** Our study revealed that at the age of 12years, 13% of the participant had their second molars in quadrant three. However, 0.78% of our participants had their second molars erupted by the age of 10years which is opposed by Jim Fuller *at al*. who suggest permanent second molars eruption by the age of 12years[12]**.** In our study, mandibular permanent second molar showed an early eruption when compared to maxillary permanent second molars. This in line with studies conducted my McGregor *et al*. on Gambian children[14]**.** The mean age of eruption and SD (*M*=11.87±0.87).

The mean age of eruption and SD for males was statistically different from those of females counterparts and males of other studies. In the present study, the mean and SD for males (*M*=12.04±1.017) in quadrant three was different from the ones obtained by Penmetsa *et al* 2018[12] whose mean age of eruption and SD was (*M*=12.8±4.2) in quadrant three. The females on the other hand showed similar differences in terms of mean age of eruption and SD for the male counterparts and females in different parts of the world with mean age of eruption and SD (*M*=12.07±0.825) opposed by studies conducted by Nassif *et al* 2020[8] whose mean age of eruption and SD was (*M*=10.79±10.9) for second permanent molar in quadrant three.

3.2 Influence of BMI on permanent first and second molar eruption

The results of our study showed the difference in the mean eruption age of permanent first and second molars, whereby teeth emergence was more advance in females than in males, in accordance with studies carried out by Gacia *et al*. 2021 who showed an advance age of emergence in females in a study conducted on southeastern Dominican children[15]**.** We observed a significant difference when body mass indices for males were compared to those of females whereby, 11.2% of the females had a higher BMI, which could be explained by the fact that females have a high body composition at early puberty when compared to males.

However, when body mass indices were compared to the CDC growth chart, 0.4% of males had body mass indices below 5th percentile within BMI group 6-8Kg/m2, with a mean age of eruption and SD of 9.14±3.134 for molar one and 11.95±1.105 for molar two, and 0.3% of females of the same age and BMI groups had their body mass indices below 5th percentile with a mean age of eruption and SD of 9.63±2.942 for molar one and 11.19±1.272 for molar two. Of all the males, 11.18% of males were of normal weight and had their body mass indices between 5th percentile and 85th percentile while of all the females, 11% were of normal weight and had BMI values between 5th and 85th percentile. This could be explained by the fact that, most of these pupils and students cover long distances to school on foot and involve greatly in academic activities that

help regulate their body composition. Of all our participants, 0.62% had first molar erupted within the age group 3-5years and BMI group 8-11Kg/m2 while 63.5% of the participants had first molar erupted within the BMI group 15-19Kg/m2.

Moreover, 45% of all the participants had second molar erupted within the age BMI group 15-19years. We observed a correlation with BMI of individuals of opposite sex and same age as most of them fell within optimal BMI range and there was no significant influence on tooth eruption. This was contrary to study conducted by Sharma *et al*. in 2020 who found a correlation between BMI and time of eruption of permanent molars[10]**.** This was equally opposed by Sindelarova *et al* 2017 who conducted a study on the relationship of obesity to the timing of permanent tooth emergence, Mohamedhusein *et al* 2020 whose study was based on association of obesity with the eruption of first and second molars in childrewn and Nagaratna *et al* 2016 whereby they conducted a cross-sectional to find a comparison of teeth eruption with body mass index among schools children in Mangalore[16].

Conclusion

We can conclude that

- Males had a precocious age of eruption of permanent first and second
- The ages of eruption of permanent first permanent molar was found to be earlier than the one mentioned in literature.
- The age of permanent second molar was found earlier than the ages mention in literature.
- The body mass indices of participants were significant and had influenced eruption ages and sequence of permanent first and second molars.
  The mean age of permanent first molar was 5.6years.
  The mean age of eruption of permanent second molar was 11.9years.

Reference

[1]. George Gj, Chatra L, Shenoy P, Km V, Prabhu R, Shanbhag VK. Age determination by schour and massler method: A forensic study. Int J Forensic Odontol. 2018.1;3:36.
[2]. Frazão P. Irrompimento do primeiro molar permanente em crianças de 5 e 6 anos de idade: implicações da análise longitudinal para prevenção da cárie oclusal. Rev Bras Epidemiol. 2011.14(2):338–46.
[3]. Assessment of Dental Age of Children Aged 3.5 to 16.9 Years Using Demirjian's Method: A Meta-Analysis Based on 26 Studies [Internet]. 2021 [cited 2021 Jan 11]. Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0084672
[4]. Almonaitiene R, Balciuniene I, Tutkuviene J. Factors influencing permanent teeth eruption. SBDMJ. 2010. 1;12.
[5]. Billewicz WZ, McGregor IA. Eruption of permanent teeth in West African (Gambian) children in relation to age, sex and physique. Ann Hum Biol. 1975. 2(2):117–28.
[6]. Souza LR, Oliveira MVM, Basile JR, Souza LN, Souza ACR, Haikal DS, et al. Anatomical and Physiopathological Aspects of Oral Cavity and Oropharynx Components Related to Oropharyngeal Dysphagia. In: Speyer R, Bogaardt H, editors. Seminars in Dysphagia [Internet]. InTech; 2015 [cited 2021 Jan 14]. Available from: http://www.intechopen.com/books/seminars-in-dysphagia/anatomical-and-physiopathological-aspects-of-oral-cavity-and-oropharynx-components-related-to-oropha.
[7]. Nevill A, Holder R. Body mass index: A measure of fatness or leanness? Br J Nutr. 1995 May 1; 73:507–16.
[8]. Nassif N, Sfeir E. Age and Sequence of Permanent Teeth Eruption in Lebanese Children. Sci World J. 2020 Aug 1; 2020:1–5.
[9]. Billewicz WZ, McGregor IA. Eruption of permanent teeth in West African (Gambian) children in relation to age, sex and physique. Ann Hum Biol. 1975 Jan;2(2):117–28.
[10]. Sharma G, Anu V, Brindha J, Carol P, Diana P, Elsy J. Does Body Mass Index affect Tooth Eruption Sequence? A Study among 6–7 Years Old Schoolchildren in Chennai, India. Int J Clin Pediatr Dent. 2020. 30;13:261–3.
[11]. Hassanali J, Odhiambo JW. Ages of eruption of the permanent teeth in Kenyan African and Asian children. Ann Hum Biol. 1981 Jan;8(5):425–34.
[12]. Penmatsa Chaitanya 1, Jampanapalli S Reddy 2, Konda Suhasini 3, Inguva H Chandrika 4, Dalavai Praveen 5. Time and Eruption Sequence of Permanent Teeth in Hyderabad Children. J Clin Pediatr Dent.2018.11(4):330-337. Doi: 10.5005/jp-journals-10005-1534.
[13]. Lakshmappa A, Guledgud MV, Patil K. Eruption times and patterns of permanent teeth in school children of India. Indian J Dent Res. 2011 Jan 11;22(6):755.

[14]. Billewicz WZ, McGregor IA. Eruption of permanent teeth in West African (Gambian) children in relation to age, sex and physique. Ann Hum Biol. 1975.1;2(2):117–28.
[15]. Garciá-Godoy. Timing of permanent tooth emergence. Google Scholar. Community Dent Oral Epidemiol. 2021.
[16]. Bagewadi. Comparison of chronology of teeth eruption with body mass index among school children at Mangalore. 2021. 14 (3), 276-80.