



Republic of Iraq
Ministry of Higher Education and Scientific Research
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**Pathology and Abnormality of the First Permanent Molar
among Children and teenagers**

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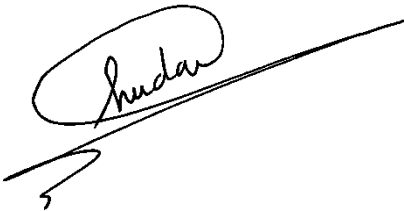
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Certification of supervisor:

I certify that this undergraduate dissertation entitled — A survey on Assessment Pathology and Abnormality of the First Permanent Molar among Children/teenagers 6-15 years old — was prepared by (Mohammed Adnan, Hussein Raheem , Hussein Abbas, Amna Sagban , Zainab Abd-ALKareem) under my supervision at the College of Dentistry Misan University in partial fulfilment of the requirements for B.D.S degree.

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Date : ***15/6/2023***

Dedication

Dear Mom, Dad, and all who have supported me,

As I graduate, I am filled with gratitude for the love, support, and guidance that I have received from all of you over the years. Your unwavering love and belief in my dreams has brought me to this exciting moment in my life.

Mom, Dad, your hard work and sacrifices have made it possible for me to achieve my goals. Your endless encouragement and support have kept me going, and I am forever grateful for the foundation you've given me.

To all my family members, friends, and mentors who have helped me through the ups and downs of my academic journey, thank you. Your words of wisdom, kind gestures, and unwavering support have given me the strength to overcome adversity and stay focused on my goals.

As I look forward to the next chapter in my life, I go with the knowledge that I am surrounded by a community of people who believe in me and want to see me succeed. It is because of you that I am who I am today and have been able to accomplish so much.

Thank you again for all your love and support, and for helping me reach this amazing milestone in my life.

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Abstract

Dental caries is one of the most common infectious diseases affecting 6–15-year-old children/teenagers, especially their first permanent molars (FPMs).

This study explored the prevalence of dental caries on FPMs by analyzing the oral health status of 400 children/teenagers aged 6–15 years in Maysan , Iraq .

The aim of this survey to assessments dental caries between male and female in the primary and secondary school (public & private) and the prevalence and the severity of dental caries in relation to the age and and gender.

The study collect a Data of 400 children in Maysan 207 male and 193 female This was an observational, epidemiological, and cross-sectional study. Selected, schools from each neighborhood. All school students were selected. Data were extracted from questionnaires completed by schoolchildren/teenagers and the decayed, missing, and filled teeth indices .

Result:

The result showed us percentage of decay permanent first molars was almost same in males to female. And higher ratio in 11 yrs. Old and less ratio in 6yrs. and 15 yrs.

Secondly: We result that the decay permanent first molars higher ratio in 11yrs., 8 yrs., 12 yrs., 9yrs., 10yrs., 14yrs., 13yrs., 6and 15yrs. Respectively to less ratio., this because in 6 yrs. was first period to eruption this tooth and 15 yrs. in this stage usually children undergo to treatment this tooth either extracted or filling. Was higher in age 8_11 because children in this stage had higher consuming to sweet and poor feeding pattern and didn't show to treatment due to fearing from dental therapy, or do not important parent, or child don't have enough awareness to maintain dental hygiene in this ages.

The conclusion from these results is that the prevalence of permanent dental caries in children in Maysan city found to be high so there is a need to increase the knowledge and attitude towards oral health, as well as provides public and school preventive programs among those children.

CHAPTER ONE

Introduction

Dental caries is one of the most preventable oral diseases among children in developing countries. This study aims to estimate the prevalence and severity of dental caries in the first permanent molar and analyze the related risk factors among sixth-grade students.

The first permanent molar (FPM) is considered as the most important tooth for the dentition and dental development with a key role in occlusion. It participates in the maxillary growth and physiology of the mandibular system.

However, it is considered to be the most and earliest affected tooth by cavities. Indeed, the early time of its eruption when hygiene is difficult and poorly controlled makes it particularly vulnerable to carious disease.

In the permanent dentition, first permanent molar was observed to be highly susceptible to carious lesions in its occlusal aspect due to the early time of its eruption, to its morphological characteristics and to its positioning in the oral cavity.

First permanent molar is the first permanent tooth appearing in the child's mouth; most parents are unaware that these teeth are the first permanent teeth and often neglect its importance considering it a primary insignificant tooth. Sometimes, parents think that the first permanent molar is a deciduous tooth, and instead of restoring it, they extract the tooth and deprive the child of the right to permanent teeth in the future.

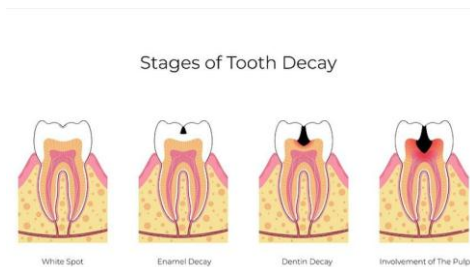


Figure (1) stages of tooth decay.

first permanent molar exhibits an increased susceptibility to caries due to its positioning in the oral cavity in the posterior region of the child's mouth which makes it further difficult for the child to properly clean this area.

The increase in the prevalence of dental caries is a result of dietary changes, including frequent consumption of high-energy, low-cost foods that are poor in nutrients and rich in sugar and fat and unbalanced consumption of sugar content.

The caries of FPM in children is characterized by its precocity and speed of evolution, due to the immaturity of the tissues that compose it. The carious lesions, often active in children, will evolve insidiously towards the chronic inflammation of the pulp and eventually towards the pulp necrosis, which can compromise the root edification. As a result, early diagnosis is essential.

The clinical examination includes both a visual examination under good lighting and a tactile examination. Visual examination can detect advanced lesions, initial lesions usually go unnoticed. Tactile examination allows sounding, useful for the detection of dentinal hardness of cavitary lesions, but is found to be iatrogenic in the detection of initial lesions.



Figure (2) Caries pattern in permanent lower first molar in 9 years old children.

In addition, FPM, due to its period of mineralization coinciding with early childhood diseases, can erupt with a structural abnormality

First permanent molar abnormalities:

1. Molar-incisor hypomineralization

Molar incisor hypomineralization, conventionally known by the acronym MIH, corresponds to the qualitative defects of the enamel, of systemic origin, affecting one or more first permanent molars, often associated with defects on one or more incisors.

The involvement of the second temporary molars and cuspidian tip of the permanent canines has also been described

The clinical aspect of the lesions is characteristic. These lesions are white, yellow, or brown opacities, well-defined with a clear demarcation between the affected enamel and the healthy one. They are located in the occlusal and/or incisal third, which may extend over a more or less important area of the coronary surface.

For mild abnormalities with a smooth enamel surface, the application of fluoride varnish and sealing of the grooves is recommended. When abnormalities are moderate with one or both affected surfaces without affecting the cusps, the teeth are restored with the composite.

In the case of severe MIH, Preformed pedodontic copings (PPC) and bonded indirect partial restorations (BIPR) in the form of onlays, overlays, or inlays are then indicated.



Figure(3): A,C- MIH involving the four FPM

B- Asymmetrical lesion of tooth with white opacities, well-defined and located in the incisal third of coronary surface.



Figure (4): (a–b–c) Severe Molar-incisor hypomineralization

2. Anatomical abnormalities

The first upper molar has a very stable anatomy with strongly expressed anatomical characteristics. However, some variations have been described for the Carabelli's tubercle; mesio-distal accessory cuspidian tubercle can have a high variability in shape and volume

The Bolk tubercle, which is sometimes present on the buccal aspect of the tooth or at the mesio-buccal angle of the upper FPM



Figure (5): A- developed Bolk tubercle on the mesio-buccal angle of the upper FPM
B- Accessory root associated with this wide tubercle

Root abnormalities are quite numerous, either in direction and number or in shape and size. Taurodontism is also a particular variety of root-shaped abnormalities



Figure (6): The four FPMs and the second temporary molars have taurodontism

3. Eruption abnormalities

Ectopic eruption of the FPM is a phenomenon that affects 3–4% of the population and is mainly observed in the upper FPMs. It corresponds to an evolution according to an abnormal mesial trajectory, thus causing the pathological resorption of the disto-buccal root of the adjacent second temporary molar. Interception of the ectopic eruption of the FPMs is essential to avoid permanent tooth blockage and the loss of space prejudicial to the eruption of adjacent premolars causing malocclusions

Inclusion is the most common eruption abnormalities encountered. Its incidence varies from 5.6 to 18.8%. The upper canines, FPMs, and lower lateral incisors are the most prone to inclusion

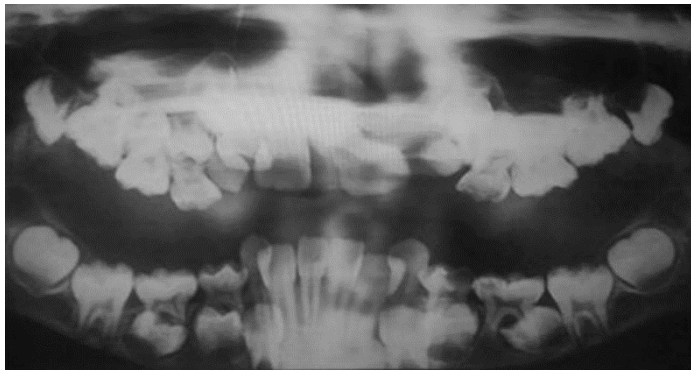


Figure (7):Retention of FPMs in an 8-year-old girl with an unlabeled syndrome

4. Agenesis

Agenesis consists in the absence of the development of a dental germ, It mainly affects the permanent teeth. The most frequently affected teeth are the lower second premolars, upper lateral incisors, and upper second premolars. The agenesis of superior FPMs is rare with a prevalence of 0.01–0.04%

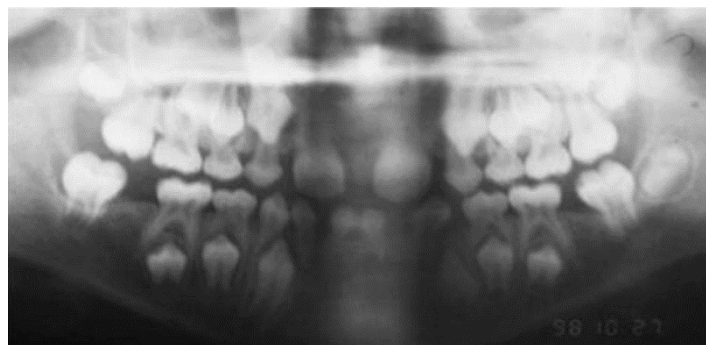


Figure (8): 12-year-old patient with agenesis of lower FPM, lower incisors, and upper lateral incisors

CHAPTER TWO

Materials and methods:

Data of 400 children in Maysan monitored aged 6 to 15 years This was an observational, epidemiological, and cross-sectional study. Selected, and then schools from each neighborhood.

All school students were selected. Conducted in multicultural areas with low socioeconomic status Data were extracted from questionnaires completed by schoolchildren and the decayed teeth indices of the schoolchildren. Were assessed, and the results analyzed.



Figure (9) A- Caries in upper first permanent tooth
B- Caries in lower first permanent tooth



Figure (10) Clinical picture

CHAPTER THREE

Results

3.1 Introduction

A set of statistical tests will be used to study the Prevalence of dental caries in the first molar in a school population of Maysan city, and it will include the relative distribution of students according to gender and age, and the extent to which the prevalence of caries is associated with gender and age using the chi-square test.

3.2 Distribution of students

Table 1 show the total of respondents was 400, 207 (51.75%) of them was male, and the rest was female 193 (48.25%) (Fig 1). Also 112 (28.0%) students aged 11 years, 90 (22.5%) aged 8 years, 78 (19.5%) aged 12 years, 40 (10%) aged 9 years, 6 (1.5%) aged for 6 years and 7 (1.75%) aged for 15 years (Fig 2).

Table1. Distribution of students by age and gender.

	Variable	Frequency	Percent %
Age	6	6	1.5%
	7	7	1.75%
	8	90	22.5%
	9	40	10.0%
	10	31	7.75%
	11	112	28.0%
	12	78	19.5%
	13	14	3.5%
	14	15	3.75%
	15	7	1.75%
		Total	400
Gender	Male	207	51.75%
	Female	193	48.25%
	Total	400	100.0%



Figure (11) Frequency of students by gender.

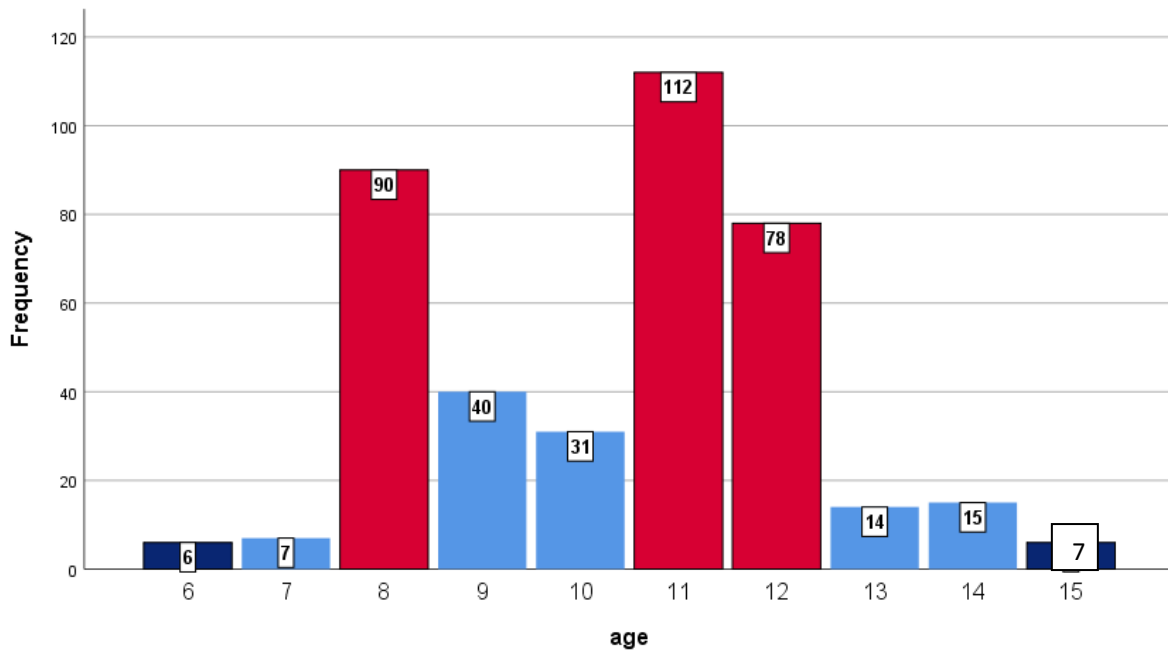


Figure (12) Frequency of students by age.

3.3 Hypotheses test

To find out the extent of the relationship between two nominal variables, chi-square test was used, So the hypothesis is as follows:

3.3.1-Gender and oral hygiene

Null hypothesis H0: The oral hygiene and gender are independent.

Alternative hypothesis H1: The oral hygiene and gender depend on one another.

Table 2 shows that the percent of oral hygiene (P) was 67.6% for male and 71.9% female, whereas the percent of oral hygiene (O) was 0.5% for male and zero for female.

The value of chi-square was 1.663 for oral hygiene. The p-value (0.645) was higher than the significance level of 0.05. Thus, the null hypothesis was accepted, and the alternative hypothesis was rejected. That mean there was not any relationship between gender and oral hygiene.

Table 2. Associate between gender and oral hygiene.

Oral hygiene		Gender		Total	Chi-square	p-value
		Male	Female			
F	N	19	16	35	1.663	0.645
	Percent %	9.2%	8.3%	8.8%		
G	N	47	38	85		
	Percent %	22.7%	19.8%	21.3%		
O	N	1	0	1		
	Percent %	0.5%	0.0%	0.3%		
P	N	140	139	279		
	Percent %	67.6%	71.9%	69.9%		
Total	N	207	193	400		
	Percent %	100.0%	100.0%	100.0%		

3.3.2-Gender and tooth side

Null hypothesis H0: The tooth side and gender are independent.

Alternative hypothesis H1: The tooth side and gender depend on one another.

Table 3 shows that the percent of tooth side (LL) was 71%% for male and 55.7% for female, whereas the percent of tooth side (UR) was 2.4% for male and 1% for female.

The value of chi-square was 17.681 for tooth side. The p-value (0.001) was lower than the significance level of 0.05. Thus, the null hypothesis was rejected, and the alternative hypothesis was accepted. That mean there was a relationship between gender and tooth side.

Table 3. Associate between gender and tooth side.

Tooth side		Gender		Total	Chi-square	p-value
		Male	Female			
LL	N	147	107	254	17.681	0.001
	Percent %	71.0%	55.7%	63.7%		
LR	N	46	80	126		
	Percent %	22.2%	41.1%	31.3%		
UL	N	9	4	13		
	Percent %	4.3%	2.1%	3.3%		
UR	N	5	2	7		
	Percent %	2.4%	1.1%	1.7%		
Total	N	207	193	400		
	Percent %	100.0%	100.0%	100.0%		

3.3.3- Age and oral hygiene

Null hypothesis H0: The oral hygiene and age are independent.

Alternative hypothesis H1: The oral hygiene and age depend on one another.

Table 4 shows that the highest rates of oral hygiene (P) was 86.7% for aged 8 years, oral hygiene (F) was 28.6% for aged 7 years, oral hygiene (G) was 66.7% for aged 15 years, and oral hygiene (O) was 0.9% for aged 11 years.

The value of chi-square was 55.946 for oral hygiene. The p-value (0.001) was lower than the significance level of 0.05. Thus, the null hypothesis was rejected, and the alternative hypothesis was accepted. That mean there was a relationship between age and oral hygiene.

Oral hygiene		Age										Total	Chi-square	p-value
		6	7	8	9	10	11	12	13	14	15			
F	N	1	2	6	9	4	3	8	1	1	0	35	55.946	0.001
	Percent %	16.7%	28.6%	6.7%	22.5%	12.9%	2.7%	10.3%	7.1%	6.7%	0.0%	8.8%		
G	N	2	2	6	9	11	17	21	5	8	4	85		
	Percent %	33.3%	28.6%	6.7%	22.5%	35.5%	15.2%	26.9%	35.7%	53.3%	66.7%	21.3%		
O	N	0	0	0	0	0	1	0	0	0	0	1		
	Percent %	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.3%		
P	N	3	3	78	22	16	91	49	8	6	2	278		
	Percent %	50.0%	42.9%	86.7%	55.0%	51.6%	81.3%	62.8%	57.1%	40.0%	33.3%	69.6%		
Total	N	6	7	90	40	31	112	78	14	15	7	400		
	Percent %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		

Table 4. Associate between age and oral hygiene

3.3.4- Age and tooth side

Null hypothesis H0: The tooth side and age are independent.

Alternative hypothesis H1: The tooth side and age depend on one another.

Table 5 shows that the highest rates of tooth side (LL) was 85.7% for aged 7 years, tooth side (LR) was 33.3% for aged 6 years, tooth side (UL) was 16.7% for aged 15 years, and tooth side (UR) was 14.3% for aged 13 years.

The value of chi-square was 64.949 for tooth side. The p-value (0.000) was lower than the significance level of 0.05. Thus, the null hypothesis was rejected, and the alternative hypothesis was accepted. That mean there was a relationship between age and tooth side.

Tooth side		Age										Total	Chi-square	p-value
		6	7	8	9	10	11	12	13	14	15			
LL	N	4	6	40	26	22	81	50	9	11	5	254	64.949	0.000
	Percent %	66.7%	85.7%	44.4%	65.0%	71.0%	72.3%	64.1%	64.3%	73.3%	83.3%	63.7%		
LR	N	2	1	49	13	8	24	22	2	4	0	125		
	Percent %	33.3%	14.3%	54.4%	32.5%	25.8%	21.4%	28.2%	14.3%	26.7%	0.0%	31.3%		
UL	N	0	0	1	1	0	5	4	1	0	1	13		
	Percent %	0.0%	0.0%	1.1%	2.5%	0.0%	4.5%	5.1%	7.1%	0.0%	16.7%	3.3%		
UR	N	0	0	0	0	1	2	2	2	0	0	7		
	Percent %	0.0%	0.0%	0.0%	0.0%	3.2%	1.8%	2.6%	14.3%	0.0%	0.0%	1.7%		
Total	N	6	7	90	40	31	112	78	14	15	7	400		
	Percent %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		

Table 5. Associate between age and tooth side

CHAPTER FOUR

4.1 Discussion

This study examined the prevalence of caries in first permanent molars (FPMs) in 6–15-year-old children/teenagers in Maysan and their distribution in terms of age and gender.

Results not any associated between gender and oral hygiene, there was a relationship between age and oral hygiene.

It has been confirmed that the caries process in the FPM starts as soon as they erupt, and caries can be clinically observed within 1–2 years after eruption. In this research, the data showed that the prevalence of FPM caries in Maysan followed a generally increasing trend in 8_11 -year-old schoolchildren, with the incidence from 22.6% in age 8 to 28. 1% in age 11 , With pit and fissure sealing conducted, it seemed that the caried prevalence rate would decrease. But in fact, efforts made to those children to treatment this teeth, because parent thought that this tooth is primary so not show any important toward this tooth. The potential reasons for the increasing rate of FPM caries in Maysan are complex since many factors might contribute to this trend. The first important plausible explanation for this increase is the persistent lack of public awareness about oral health. According to the results, 70.2 % of student had fully caries Lesion on FPMs at 8_11 years.

The second explanation for this finding is the dietary pattern . dietary patterns in public Iraq have changed from a traditional diet to a modern diet with a high intake of meat, refined grains, and sugar-sweetened beverages among Chinese children aged 6–15years.

The last but not the least plausible explanation is limited access to dental health services. A dental visit might ensure that the dentist would take preventive

measures, such as the application of fluoride and fissure sealants, provision of oral hygiene instructions, and emphasis on the importance of regular visits to a dentist.

This investigation showed not associated between gender but their a relationship between age where 8_12 years had higher ratio between ages, this return to parent not effort any important toward this tooth, though that is primary tooth. In this ages of children has poor feeding patterns, in addition child don't have enough awareness to maintain dental hygiene in this ages.

Based on the results of the present research, caries prevention strategies should focus on three aspects, First, oral health education should raise awareness about the importance of oral hygiene and proper nutrition, particularly to limit sugar intake and soft non-abrasive foods. Second, the preventive programs should expand their target groups to cover a wider age range to include younger children, potentially beginning with prenatal education of mothers and adoption of proper measures. The last but not the least is the emphasis on the leading role of the government in the prevention and management of oral diseases, most children's dental problems cannot be managed, resulting in the loss of teeth at a very young age. They will not visit a clinic for restorative treatments due to defects in their dentition and will not adopt preventive measures in advance. Improvements in the economic status will give rise to more attention to oral health status. Unfortunately, oral health education has not been rendered in most rural areas. In such a case, the government-guided oral health education (OHE) can effectively control and prevent oral diseases. It includes the construction of a network for prevention, the management of oral diseases at all levels, and the establishment of national and regional stomatological/dental health education centers, effectively promoting the oral health during the whole life span.

4.2 Conclusion and Recommendations

Conclusion

From the above results, the following conclusions can be put:

- 1- There was not any associate between gender and oral hygiene.
- 2- There was an associate between gender and tooth side.
- 3- There was a relationship between age and oral hygiene.
- 4- There was a relationship between age and tooth side.

Recommendations

The study recommends the following:

1. Expanding the study to include the largest number of children (6-15 years old) and in several governorates.
2. Increasing awareness programs related to oral hygiene for children, whether through the school curriculum, or drawings in schools.

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