

ASSESSMENT OF FIRST PERMANENT MOLAR HEALTH STATUS IN 6-15 YEARS OLD CHILDREN VISITING KHYBER COLLEGE OF DENTISTRY, PESHAWAR: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: To assess the health status of the first permanent molar (decayed, missing, filled teeth, hypoplasia, and hypocalcification) in 6-15 yrs old children.

Materials and Methods: A total of 147 children ranging from the age of 6-15yrs with a mean of 9.36 ± 2.63 yrs were considered in the study. A self-prepared performa was used to collect data regarding decayed, missing, filled, hypoplastic, hypocalcified first permanent molars in children attending the paediatric department, Khyber College of Dentistry, Peshawar. Demographic data like age, gender, and parental occupation (for socioeconomic status) were also recorded in the same performa. Children were examined on the dental chair by using a probe, mouth mirror, and tweezers. The collected data were analyzed using SPSS version 16.0. Frequencies and percentages of the variables were tabulated. The Chi-square test was applied for comparison among different socioeconomic levels. P -value ≤ 0.005 was considered significant statistically.

Results: Out of a total of 147 children, ninety-seven were males (64.7%) and 53 were females (35.3%), with a male to female ratio of 2:1. The health status of the first permanent molar is poor in young children of low socioeconomic status.

Conclusion: It is concluded from the study that the health status of the first permanent molar is poor in young boys whose parents were having low socioeconomic status.

Keywords: FPMs, DMFT, hypoplasia, hypocalcification

INTRODUCTION

First permanent molars (FPMs) are more vulnerable to dental caries because of their functional, morphologic, and surrounding oral conditions which the newly erupted first permanent molars have to face in the oral cavity of young children.¹ An increased number of carious FPMs leads to an increase in DMFT.² The patients who experience high caries in

early life would have an increased risk of caries in adulthood.³ The FPMs have a vital role in the normal masticatory function and dentofacial harmony.⁴ So, the prevention of FPMs caries during childhood is very important and some local specific measures like application of fluoride varnish, sealing of pits and fissures are used in dental health facilities to overcome this problem.^{5,6} Al-Samadani studied the caries status of the FPMs of 108 primary school children age ranging from 9–12 in Jeddah, Saudi Arabia.⁷ The prevalence of all four healthy FPMs varied with the age of the children, maximum (33%) in the 9 years olds children, a minimum (16.5%) in the 12 years old children, and 32.5% of the children had all their

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newly formed FPMs healthy and sound. In a study conducted in Karachi, Pakistan, the prevalence of FPMs caries to be 30.6% in 8-12 years old children, and was recorded high in girls than boys.⁸

For the assessment of FPMs status, we used the DMFT index (number of decayed, missed, filled teeth).⁹ Pontigo observed a strong association with the detailed DMFT and FPM-DMFT and concluded that the overall caries status depends on FPMs.¹⁰ In another study in Iranian city, Babol revealed that the mean DMFT of the 1st permanent molar (DMFT6) in 12-year children was 1.59 ± 2 , and was recorded high in boys compared to girls.¹¹ Similarly a study at Larestan, Iran, the mean DMFT6 was recorded high (1.00 ± 1.36 ; 1.07 ± 1.39 in girls and 0.93 ± 1.33 in boys) compared to WHO standards in 2010 (≥ 1).¹² Fazeli conducted a study in May 2002, on 327 primary school children of Bandargaz Iran and calculated the DMFT6, which was found to be $0.0.7665 \pm 1.1562$ for girls and 0.4938 ± 0.8687 for boys.¹³

The development timing of FPMs crowns brings them vulnerable to enamel defects that lead to hypoplasia and hypocalcification.¹⁴ Collective first permanent Molar-Incisor hypo-mineralization (MIH) is also a recognized situation the cause of which is not known.¹⁵ The eruption of FPMs at the age of 6 years also makes them susceptible to the initiation of dental caries, and most of FPMs extracted today due to the progression of dental caries.^{16, 17}

In addition, to assess the health status of the FPMs (DMFT, hypoplasia, hypocalcification) in 6-15 years old children, an attempt was also made to visually categorize the FPMs as carious/grossly carious, filled/heavily filled.

MATERIALS AND METHODS

After taking approval from the ethical review committee of Khyber College of Dentistry, Peshawar, this descriptive (cross-sectional) study was completed at the Paediatric Dentistry Department from June 2018 to Feb 2019. For the collection of 147 patients samples, a convenient sampling technique was used and Patients having erupted FPMs in both arches with an age range between 6-15 years of both genders were included in the study. Handicapped children and children missing FPMs due to causes other than caries were excluded from the study.

The complete history and informed consent of

the patient parents were taken, followed by a clinical examination of the FPMs. A specifically designed performa was used to record socioeconomic status, occupation of parents, demographic data (name, age, gender, occupation, address), and data regarding the health status of FPMs (decayed, missing due to caries, filled, hypoplastic, hypocalcified).

It was also recorded whether the FPMs were grossly carious or heavily filled (caries destroying more than half of the crown was recorded as grossly carious and restorations more than half of the crown were recorded as heavily (filled). The clinical examination of the FPMs was carried out under dental unit light by using a blunt probe, mouth mirror, and tweezers.

The collected data were evaluated by applying SPSS version 16.0. Frequencies and percentages of the variables were tabulated. The Chi-square test was applied for comparison among different socioeconomic levels status of the children's parents. P-value ≤ 0.005 was considered significant statistically.

RESULTS

Total 147 children with all four erupted FPMs were involved in the study. Out of 147, 97 were males (64.7%) and 53 were females (35.3%) with a 2:1 male to female ratio. The children's ages ranged between 6-15 years with a mean of 9.86 ± 2.63 years. The most common age group was 6-9 years (50.0%). The age distribution details are given in Table 1.

Fig 1 shows the socioeconomic status of parents estimated from the occupation. Low socioeconomic group dominating the sample (42%).

Table 2 demonstrates the health status of FPMs by parent's socioeconomic status occupation. Children belonging to parents with low socioeconomic status had poor health of FPM.

Table 3 demonstrates the health status of FPMs in children by gender of patients. There is no sexual dimorphism.

Table 4 demonstrates the health status of FPMs by age of children. More teeth are affected at earlier ages.

DISCUSSION

Caries were the common health status noted in all FPMs in children from 6 to 15 years. Marthaler¹⁸

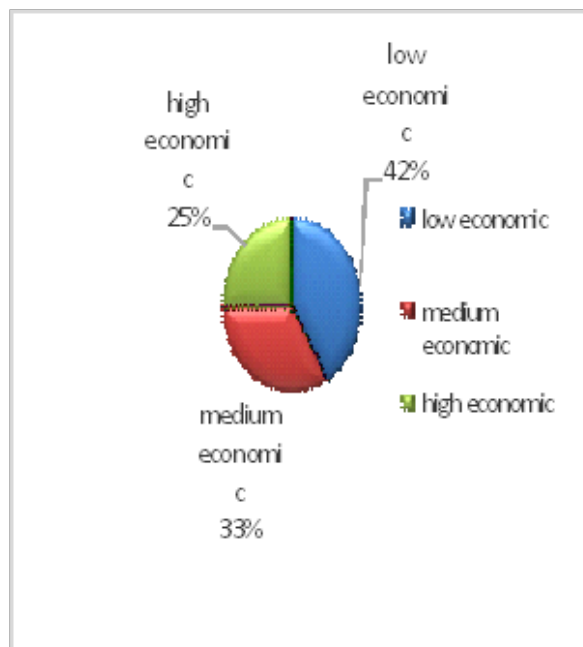


FIG 1: Occupation of children's parents

conducted a study on the dental caries prevalence in the children of Europe, indicating a high rate of caries. Marthaler's findings support the present study.

The Bagramian reviews the epidemiological data of many countries that indicate a marked increase in dental caries prevalence.¹⁹ This prevalent increase in the prevalence of dental caries affects both primary and permanent dentition and the crown as well as surfaces of the root. The factors responsible for this high caries prevalence are lack of teeth cleaning practices with fluoride-based dentrifices, improper tooth brushing techniques, sugary diet, rare or no oral health educational programs at schools, and irregular visits to the dentist. Bagramian's study supports the present study, in our population; we are also lacking these facilities. So, the prevalence rate of caries is high in children.

Arrow studied the prevalence of FPMs enamel hypoplasia in children and reported a high score

Table 1: Age Distribution

Age(years)	No	%
6-9	75	50.0
10-12	44	29.3
13-15	28	18.6
Total	147	100

Table 2: Health Status of the FPMs in children by parent's occupations

Socioeconomic status of parents	Tooth	Condition of the tooth						
		carious	Filling	g.carious	hypoplastic	H+C	missing	Sound
Low	RL	12	1	9	1	1	3	32
	LL	22	1	8	0	1	4	32
	RU	20	2	8	1	1	0	23
	LU	15	0	3	0	1	0	48
Medium	RL	20	0	3	0	1	3	22
	LL	15	0	3	0	1	1	26
	RU	11	2	2	0	2	0	39
	LU	6	0	4	0	0	0	41
High	RL	12	0	5	0	0	2	21
	LL	8	1	2	0	0	0	23
	RU	6	8	2	0	0	0	35
	LU	9	3	1	0	0	0	22

Chi-square(X²)=1.96 P-value=0.001

Table 3: Health Status of the FPMs in children by gender

Condition	Tooth							
	RL		LL		RU		LU	
	F	M	F	M	F	M	F	M
CARIOUS	17	27	17	28	18	19	11	16
FILLING	1	0	2	0	2	10	3	0
GROSSLY CARIOUS	10	7	7	6	6	8	4	4
HYPOPLASTIC	1	0	0	0	0	1	0	0
H+C	2	0	2	0	1	0	1	0
MISSING (due to extraction)	6	1	2	3	0	0	0	0
SOUND	22	53	23	59	31	66	35	76

square(X^2)= 3.91 P-value=0.012

Table 4: Health Status of the FPMs in children by patient’s age

Age range	No. Pt	tooth	Condition of tooth						Sound
			carious	filling	g.carious	hypoplastic	H+C	missing	
6-9 yr	10	RL	22	0	11	0	1	6	35
		LL	23	1	9	0	1	2	39
		RU	19	1	8	1	1	0	46
		LU	15	2	3	0	1	0	55
10-13yr	59	RL	15	1	6	0	1	1	33
		LL	16	1	4	0	1	3	34
		RU	14	0	4	0	0	0	42
		LU	8	1	5	0	0	0	45
14-15yr	16	RL	7	0	0	1	0	1	7
		LL	6	1	0	0	0	0	9
		RU	4	0	0	2	0	0	9

Square (X^2)= 2.51 P-value=0.011

in the Australian population.²⁰ He examined 511 children with mean age 7.1 years, SD 0.5, with at least one erupted FPM. He observed that the enamel defects (hypoplasia) in the form of white diffuse opacity were present in 46% of upper right FPMs, 47 percent of upper left FPMs, 40% of lower left, and 41% of lower right FPMs. Enamel hypoplasia in the form of demarcated opacities was present in 11% of upper right FPMs, 14% of upper left FPMs, 10% lower left FPMs, and 9% lower right FPMs. These findings greatly differ from the present study. In the present study, only a 0.7% prevalence of hypoplasia was reported. Many reasons may be responsible for these variations in results, small sample size i.e., 147 cases contrast to 511 cases in Arrow’s study. Arrow’s study was a three longitudinal study while the present study was cross-sectional.

Răducanu reported the prevalence of loss of FPMs in a retrospective study from 2001-2007 by using the records of 849 Romanian patients who had visited the Paediatric Dentistry Department in between 8-17years of age.²¹ Out of these 849 children and adolescents 44 (5.1%) had lost FPMs as a result of extractions. Răducanu’s study supports the present study because it reports 3.3% missing FPMs in children due to extraction.

This study is the first of its kind in Peshawar exploring the frequency, severity of caries, DMFT/ hypoplasia/hypocalcification of FPMs in children. However, it has some limitations including a small sample size and being conducted in the dental hospital instead of the community.

CONCLUSIONS

It is concluded from the study that the health status of the FPM is poor in young boys whose parents had low socioeconomic status, suggesting that the socioeconomic condition also influenced the health status of FPMs, and boys are more careless about their oral hygiene as compared to girls under the age of sixteen.

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