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Original Article

Relationship between mothers' awareness of eruption time of first permanent molar and its caries in 7-9-year-old children

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Abstract

Introduction: Since the first permanent molar (FPM) as a first permanent tooth erupts between 6-7 years old and has a long period of eruption, it is the most caries prone tooth. One of the problems is inadequate knowledge of parents about the eruption time of the FPM; because these teeth erupt behind the deciduous teeth without a primary successor. In the present study, mothers' knowledge about its eruption time and its effect on health of these teeth was evaluated.

Materials& Methods: This cross-sectional study was conducted on 406 schoolchildren (7-9 years old) and their mothers using multi-stage sampling in Babol in 2017. Mothers completed the check list according to the study objectives. Clinical status of FPM was measured using DMFT (Decayed, Missed, Filled Teeth) index. Finally, data were analyzed with SPSS 18 using t-test and chi-square. Significance level was considered as $p<0.05$.

Results: Mothers' awareness about the eruption time of FPM ($p<0.001$) was associated with higher ratio of children with sound FPM. Mothers' education level was the most significant contributing factor to mothers' knowledge about FPM eruption time.

Conclusion: Mothers' education and their knowledge about the FPMs eruption time were the major predictors of FPM caries status.

Keywords: Mothers, Awareness, Tooth eruption

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ارتباط بین آگاهی مادر از زمان رویش دندان مولر اول دائمی و پوسیدگی آن در کودکان ۷ تا ۹ سال

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چکیده

مقدمه: از آن جایی که مولر اول دائمی اولین دندانی است که در سنین ۶ تا ۷ سال در دهان میروید و دوره رویش طولانی دارد، مستعدترین دندان برای پوسیدگی است. یکی از معضلات موجود، آگاهی نادرست والدین نسبت به زمان رویش اولین مولر دائمی است. زیرا این دندان‌ها در پشت دندان های شیری رویش می یابند و جایگزین هیچ یک از دندان های شیری نمی شوند. در مطالعه حاضر، آگاهی مادران درباره زمان رویش مولر اول دائمی در دهان کودکان و تاثیر آن بر سلامت این دندان ها مورد ارزیابی قرار گرفت.

مواد و روش ها: این مطالعه مقطعی بر روی ۴۰۶ دانش آموز (۹-۷ ساله) و مادران آنها با استفاده از نمونه گیری چند مرحله ای در بابل در سال ۱۳۹۶ انجام شد. پس از نمونه گیری، مادران یک چک لیست را بر اساس اهداف مطالعه پر کردند. دندان های هر کودک با استفاده از ایندکس DMFT معاینه شد. در نهایت داده ها با استفاده از نرم افزار آماری SPSS 18 با آزمون t و کای دو مورد تجزیه و تحلیل قرار گرفتند. $p<0.05$ معنی داردرنظر گرفته شد.

یافته ها: آگاهی مادران در مورد زمان رویش مولر اول دائمی با نسبت بالاتر سلامت این دندان ارتباط معنی داری داشت. ($p<0.001$) سطح تحصیلات مادر مهمترین عامل تاثیرگذار بر آگاهی مادران از زمان اولین رویش مولر دائمی بود.

نتیجه گیری: آگاهی مادران از زمان رویش مولر اول دائمی و سطح تحصیلات آنها مهمترین فاکتور تاثیرگذار بر وضعیت پوسیدگی دندان مولر اول دائمی بود.

واژگان کلیدی: مادران، آگاهی، رویش دندان

Introduction

Dental caries (DC) is one of the most common diseases in childhood.[1] It occurs because of an imbalance between the tooth surface and microbial biofilm, leading to demineralization of tooth surfaces.[2] In the early mixed dentition period, DC risk is higher due to the child's eating habits and lack of proper learning of oral hygiene.[3] Since the first permanent molar (FPM) as a first permanent tooth erupts between 6-7 years old and has a long period of eruption, it is the most caries-prone permanent tooth.[4] Moreover, the main reason of decay of FPM is that the toothbrush cannot reach to the difficult-to-clean areas of teeth in the mouth.[5] FPM is one of the most important permanent teeth due to its main role in maintenance of vertical facial height, providing support for facial muscles and acting as a guide for eruption of other permanent teeth.[6] One of the problems is inadequate knowledge of parents about the eruption time of the FPM. Because these teeth erupt behind the deciduous teeth and do not replace primary teeth; hence, the parents assume that these are deciduous teeth and do not care about their health.[7] Zouashkiani et al. have shown a significant effect of parental knowledge about the time and manner of the FPM eruption on dental health of the child.[8] In contrast, in a study performed by Vejdani et al, there was no significant relationship between mothers' educational level and parental knowledge

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about eruption time of FPMs with DMF6.[9] Considering the fact that knowledge and health beliefs of the children are formed up to the age of 12, the parents' knowledge about the time and manner of eruption of the teeth can play a significant role in improving the oral health of the child and consequently maintaining oral and dental health.[10] According to Chhabra et al. in 2012, parental knowledge about oral hygiene and health habits has a significant impact on their children's oral hygiene.[11] Okada et al. suggested that regular dental examinations lead to positive knowledge and attitude of mothers toward oral hygiene, which, in turn, affect their children's oral health.[12] Regarding the fact that prevention is better than treatment; nowadays, the inclination is toward the priority of disease prevention over its incidence, the aim of this study was to investigate the relationship between the knowledge of mothers about eruption time of FPM and its caries.

Materials & Methods

This cross-sectional study was approved by Ethical Committee of Babol University of Medical Sciences (Ethical number: mubabol.rec.1396.6). The study was conducted on 406 schoolchildren (238 boys, 168 girls), aged between 7-9 years and their mothers using multi-stage sampling in Babol, Iran in 2017. To select the schools, all schools in Babol were divided into four categories of governmental girls' school, governmental boys' school, non-governmental girls' school and non-governmental boys' school. Regarding the sample size of the study and distribution of students in the schools via throwing a dice, 2 governmental girls' school, 2 governmental boys' school, 2 non- governmental boys' school and 1 non-governmental girls' school were selected. Totally, 58% of students were in governmental schools and 42% in non-governmental schools.

According to the statistics of Education Department, 123 (53%) and 109 (47%) students of governmental schools as well as 126 (68%) and 114 (32%) children of non- governmental schools were boy and girl, respectively. At first, each student received a checklist to be completed by their mothers. This checklist contained questions regarding knowledge of mothers about the eruption time of the FPM; such as does your child have a permanent molar in his/her mouth, or when does the FPM erupt? In addition, the checklists were anonymous and included questions about demographic characteristics of mothers, their educational status and history of child dental visit in the last year. After returning the checklist, the teeth of each child were examined and the children whose PFM was not erupted were excluded from the study. All studied samples were examined by a fifth-year dentistry student on a usual chair in room light using mirrors and CPITN probe. Due to calibration of the examiner, first, the examiner practiced examinations under supervision of a pediatric dentist (master) on a group of 10 children.

Then, the examiner and the master examined the group of 20 children alone. This procedure repeated, and findings were compared until the 85-95% agreement was obtained between the examiner and master. To assess reliability, this examination was repeated on the same group of 20 children a week later. Results showed 85 % agreement. Next, DMFT of FPMs was determined and fissure-sealed FPMs were designated in each student by oral examination.

Finally, the data were analyzed using SPSS 18 through t-test and chi-square; and $p<0.05$ was considered statistically significant.

Results

Totally, 406 students accompanied with their mothers were entered into this study. The students were 7-9 years old (mean 7.9±0.81). Mean DMF of FPM was 1.17±1.33 and ranged from 0 to 4. Among all students, 219 (53.9%) showed carious FPM. Of the whole mothers, 205 (50.5%) were aware about the correct time of FPM eruption.

The relationship between DMF6 and study subjects' demographic and personal characteristics are shown in table1. Higher level of mothers' education ($p < 0.001$) and mothers' awareness about the eruption time of FPM ($p<0.001$) was associated with higher ratio of children with sound FPM.

The relationship between the frequency of last year dental visit and ratio of children with no DMF6 was significant ($p=0.04$). However, the relationship between frequency of last year dental visit and mean DMF6 was not significant (Table 1). Regarding to multivariate logistic regression results, the increase of student' age (OR highest level versus lowest level = 9.48, 95% CI 5.27–17.02), low educational level of mothers (OR lowest level versus highest level = 2.31, 95% CI 1.18–4.54), and mothers' lack of knowledge about the eruption time of FPM (OR lowest level versus upper level = 2.02, 95% CI 1.27–3.22) were the most significant contributing factors to DMF6≥1(Table 2).

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Table 1. DMF6 based on students' demographic characteristics and maternal education

	DMF6		P*	Total	Mean±SD	P**
	No N(%)	Yes N(%)		N(%)		
Student age						
7 years	101(74.3)	35(25.7)	<0.001	136(100)	0.46 ± 0.926	
8 years	53(39.3)	82(60.7)	<0.001	135(100)	1.21 ± 1.234	<0.001
9years	33(24.4)	102(75.6)	<0.001	135(100)	1.84 ± 1.419	
Student's genders						
Girl	118(49.6)	120(50.4)	0.09	238(100)	1.24 ± 1.325	
Boy	69(41.1)	99(58.9)	0.09	168(100)	1.12 ± 1.339	0.418
Type of schools						
Governmental	97(40.9)	140(59.1)		237(100)	1.28 ± 1.349	
Non-governmental	90(53.3)	79(46.7)	0.01	169(100)	1.02 ± 1.298	0.01
Last year dental visit						
Never	53(51.0)	51(49.0)	0.04	104(100)	1.21 ± 1.419	
Once	28(34.1)	54(65.9)	0.04	82(100)	1.26 ± 1.245	
More than once	106(48.2)	114(51.8)	0.04	220(100)	1.26 ± 1.245	0.445
Mother's education level						
Under Diploma	26(32.5)	54(67.5)		80(100)	1.68 ± 1.439	
Diploma	68(44.7)	84(55.3)	0.007	152(100)	1.16 ± 1.298	
Academic education	93(53.4)	81(46.6)	0.007	174(100)	0.95 ± 1.255	<0.001
Mothers' awareness of eruption time						
Yes	117(57.1)	88(42.9)	<0.001	205(100)	0.78 ± 1.097	
No	70(34.8)	131(65.2)	<0.001	201(100)	1.57 ±1.43	<0.001

*By Chi^2-square, ** By ANOVA& t-test

Table 2. Multivariable logistic regression in determining the risk factors of DMF6

Variables	Odds ratio	95% confidence interval (CI)	P value*
Age(year)			
7[a]	-	-	
8	4.93	2.84-8.53	<0.001
9	9.48	5.27-17.02	<0.001
Gender			
Boy	1.57	0.98-2.50	0.051
Girl[a]	-	-	
Type of school			
Governmental	1.24	0.7-2.17	0.45
None-governmental	-	-	-
Last year dental visit			
Never	1.86	1.00-3.46	0.051
Once	0.75	0.42-1.33	0.33
More than once[a]	-	-	
Mother's education level			
Under Diploma	2.31	1.18-4.54	0.01
Diploma	1.27	0.76-2.13	0.34
Academic education	-	-	
Mothers' awareness of eruption time			
Yes[a]	-	-	
No	2.02	1.27-3.22	0/003

* Multivariable logistic regression [a] reference

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Higher educational level of mothers (p<0.001) and frequent dental visits (p=0.002) were associated with higher ratio of mothers' awareness about FPM eruption time (Table 3). However, the effect of frequency of dental visits changed to non-significant in the adjusted model (table 4). Higher educational level of mothers (OR lowest level versus highest level = 0.26, 95% CI 0.15–0.46) was the most significant contributing factor to mothers' knowledge about FPM eruption time (Table 4).

Table 3. Mothers' knowledge about FPM eruption time based on their educational level, their number of children, children's birth order, and last year dental visit

Variables	Knowledge level No Number (Percentage)	Yes Number (Percentage))	P	Total
Mother's education level				
Under Diploma	54(67.5)	26(32.5)	<0.001	80(100)
Diploma	85(55.9)	67(44.1)	<0.001	152(100)
Academic education	62(35.6)	112(64.4)	<0.001	174(100)
Number of children				
1	73(48.3)	78(51.7)	0.73	151(100)
2	114(50.2)	113(49.8)	0.73	227(100)
3	11(47.8)	12(52.2)	0.73	23(100)
4	3(60.0)	2(40.0)	0.73	5(100)
Children's Birth order				
1	147(50.9)	142(49.1)	0.43	289(100)
2	45(44.1)	57(55.9)	0.43	102(100)
3	9(64.3)	5(53.7)	0.43	14(100)
4	-	1(100)	0.43	1(100)
Last year dental visit				
Never	61(58.7)	43(41.3)	0.002	104(100)
Once	49(59.8)	33(40.2)	0.002	82(100)
More than once	91(41.4)	129(58.6)	0.002	220(100)

*chi^2-square

Table 4. Multivariable logistic regression in determining the effective factors in mother's awareness of eruption time

Variables	Odds ratio	95% confidence interval (CI)	P*
Mother's education level			
Under Diploma	0.26	0.15-0.46	<0.001
Diploma	0.43	0.27-0.68	<0.001
Academic education	-	-	
Last year dental visit			
Never	-	-	
once	0.31	0.40-1.1	0.118
More than once	0.47	0.34-1.01	0.059

*Multivariable logistic regression

Discussion

The aim of this study was to investigate the relationship between DC on FPMs (DMF6) among 7-9-year-old children and their mothers' knowledge about the eruption time of these teeth. Based on the results of this study, mothers' awareness of eruption time of FPMs significantly was related to incidence of caries in these teeth. Mother' awareness was significantly affected by their educational level. The overall mean DMF6 was 1.17, which is similar to that (1.15) found in the study of

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Zouashkiani et al. in 2007, [8] but it was much less in Chinese children (0.44) in 2013.[13] Findings of this study revealed that higher age of children, low educational level of mothers and mothers' knowledge about the eruption time of FPM were related to higher DMF6. About two-thirds of the children with aware mothers had sound FPM. Consistent with previous studies, the DMF6 is increased by age over time and the teeth are more exposed to DC risk factors such as poor oral hygiene an non-milk extrinsic sugar.[13-15]

Similar to previous findings, mothers' educational level was related to DMF6 status. Higher educated parents are more aware of their children dental care, leading to lower caries in the first molars of their children.[1,16,17] It may be due to they usually use more sources of information such as books, magazines and informative programs, resulting in higher level of awareness.

Conversely, Asgari et al. in 2017 and Hashemi et al. in 2018 reported that there was no significant relationship between maternal education level and DC of permanent molars.[18,19] This controversy revealed the importance of adding oral hygiene and dental care guidelines to the curricula of other academic fields.[8]

Present study showed a significant association between mothers' lack of knowledge about the eruption time of FPM and DMF6≥1. This finding is in accordance with previous ones, representing the positive effect of parents' knowledge about the eruption time of FPM on DMF6 status and children's dental health as well. [8, 20] It is because they take care of these teeth more effectively when they know that these are permanent ones. Parents' educational level was the only contributing factor to their awareness about age of FPM eruption in the adjusted model. Similarly, Radica Luca et al. expressed that mothers with academic degree were more aware of age of eruption of FPM compared to less-educated ones.[9] Nevertheless, other studies found that even educated mothers were unaware about the eruption time of FPM or their children's dental health status. Therefore, oral health education interventions seems necessary for all mothers without concerning their level of education.[3,8]

Conclusion

Children with mothers aware of age of eruption of FPM had higher percentage of sound FPM. This awareness is influenced by educational level of mothers. In future, oral health education interventions should include eruption sequence of permanent teeth as well as oral health care instructions for children and parents at the same time.

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Conflict of interest: We declare no conflict of interest.

Authors' Contributions

The study was designed by Mahtab Hamzeh, and Maryam Hosseini defined the conceptual content of the research. The study data were collected by Maryam Hosseini. Preparation of manuscript was performed by Maryam Hosseini,its editing and revision were done by Mahtab Hamzeh and MohammadMehdi Naghibi Sistani. Statistical analysis and interpretation of data were accomplished by Soraya Khafri.

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