Pesquisa Brasileira em Odontopediatria e Clínica Integrada 2021; 21:e0004
https://doi.org/10.1590/pboci.2021.134
ISSN 1519-0501 / eISSN 1983-4632

ORIGINAL ARTICLE

Dentists' Knowledge and Clinical Experience towards Molar-Incisor-Hypomineralization in Iran

Fatemeh Sadat Sajadi[1], Naimeh Hasheminejad[2], Alireza Mehdizadeh[3], Ali Eskandarizadeh[4], Mohammadreza Rostamizadeh[5]

[1]Oral and Dental Diseases Research Center, Department of Pediatric Dentistry, Faculty of Dentistry, Kerman University of Medical Sciences, Kerman, Iran.
[2]Oral and Dental Disease Research Center, Department of Dental Public Health, Faculty of Dentistry, Kerman University of Medical Sciences, Kerman, Iran.
[3]Private Practice, Kerman, Iran.
[4]Department of Restorative Dentistry, Faculty of Dentistry, Kerman University of Medical Sciences, Kerman, Iran.
[5]Oral and Dental Disease Research Center, Faculty of Dentistry, Kerman University of Medical Sciences, Kerman, Iran.

Correspondence: Naimeh Hasheminejad, Oral and Dental Disease Research Center, Department of Dental Public Health, Faculty of Dentistry, Kerman University of Medical Sciences, Kerman, Iran. **E-mail:** hnaimeh@yahoo.com

Academic Editor: Alessandro Leite Cavalcanti

Received: 14 January 2021 / **Review:** 03 April 2021 / **Accepted:** 29 April 2021

How to cite: Sajadi FS, Hasheminejad N, Mehdizadeh A, Eskandarizadeh A, Rostamizadeh M. Dentists' knowledge and clinical experience towards molar-incisor-hypomineralization in Iran. Pesqui Bras Odontopediatria Clín Integr. 2021; 21:e0004. https://doi.org/10.1590/pboci.2021.134

ABSTRACT

Objective: To determine the knowledge and clinical experience of dentists regarding MIH in Kerman/Iran. **Material and Methods:** In this cross-sectional study, a census sampling method was used, and all dentists registered in Kerman medical council were asked to participate in the study. A validated and reliable researcher administered questionnaire was used to determine participants' demographic characteristics, knowledge, and clinical experience. The association between knowledge score and demographic variables was determined using an independent t-test and ANOVA. The level of significance was set as 0.05. **Results:** Overall, 400 specialized and general dentists in Kerman completed the questionnaire. The mean knowledge score of dentists was 6.6±1.9 of 11. Female dentists' knowledge was higher than male dentists ($p<0.05$). General dentists had a higher level of knowledge regarding MIH compared to specialists ($p<0.05$). Overall, 79.5 % had been faced with MIH during their practice years. After confronting MIH teeth, 48.8% of dentists referred patients to specialists for treatment. Providing aesthetics was considered the most difficult part of treatment (43.2%). Resin composite was the most favorable dental material for treating MIH (60.9%). **Conclusion:** Although most dentists in Kerman had encountered MIH defects during their clinical practice, they did not have enough knowledge of the defect and required education on all aspects of MIH diagnosis and management. Younger dental practitioners, general dentists and females presented higher knowledge of MIH.

Keywords: Dental Enamel Hypoplasia; Dentists; Knowledge.

Introduction

The term Molar-Incisor-Hypomineralization (MIH) was first introduced by Weeheijm et al. in 2001 [1]. It is defined as a hypomineralized defect of enamel that originates from a systemic problem affecting one or more first permanent molars. Permanent incisors are also usually involved [2]. Although the definite cause of the defect is still unclear, studies suggest that MIH is probably associated with fever and childhood illnesses such as pneumonia and asthma [3-5].

This condition is widely reported in recent literature as a common enamel defect in children [4,6-8]. White to brown demarcated opacities are reported due to mineral changes in enamel composition, leading to a porous enamel surface. This makes the affected teeth more susceptible to dental caries [9]. Mild MIH conditions exhibit similar clinical signs as dental caries, and in areas where caries rate is lowering, the diagnosis of the condition has become more prevalent [10]. Results of a meta-analysis reported the mean worldwide prevalence of MIH to be 13.1% (11.8-14.5%) [11]. The burden of disease seems to be higher in middle and low-income countries [11].

Teeth with MIH are sensitive to different stimuli leading to insufficient oral health care [2]. In severe cases, enamel breakdown results in extensive treatment needs [2]. Also, MIH has negative effects on a child's quality of life. In addition to pain, it contributes to a lack of self-esteem and embarrassment, especially when incisors are involved [12].

Child's behavior management is another challenge as this is a condition that needs treatment in young children [13]. Obtaining efficient local anesthesia is also reported to be difficult. Due to disordered enamel prisms, opacities act unpredictably during treatment and cavity preparation is often difficult [14]. Likewise, many adhesive dental materials fail to bond effectively with MIH affected teeth [13].

Elhennawy et al. [15] carried out a study to assess the knowledge and attitude of German dental students regarding MIH and reported that they did not have enough knowledge of the condition and were not confident with the diagnosis and treatment. Many dental professionals around the globe consider MIH as a condition that needs further investigation [16-19]. One study conducted in two dental schools in Iran revealed that more than half of Iranian academic specialist dentists were not confident in diagnosing MIH and presented diversity regarding treatment planning for this condition. This study did not include general dentists working in private practice; therefore, it is not generalizable to the whole dentist population group. [16]. Meanwhile, research about MIH is limited in Asia, Middle East [2] and Iran. Therefore, this study aimed to determine the knowledge and clinical experience of general dentists and specialists regarding MIH in Kerman city, the center of the largest province in the southeast of Iran.

Material and Methods

Study Design and Ethical Clearance

This analytical cross-sectional study was carried out in the city of Kerman, which is the center of the biggest province in southeast of Iran. Data was collected from September 2019 to July 2020. The study was approved by the ethics committee of Kerman University of Medical Sciences and ethical code IR.KMU.REC.1399.124 was allocated to the study. Written informed consent was obtained from each dentist prior to data collection.

Population

A census was carried out, and all dentists who were registered in Kerman medical council were selected to participate in the study. Among them, 410 were general dentists, and 80 were specialists in different fields of dentistry. Dentists with at least one year of clinical experience were included in this research, and a total of 400 dentists were included.

Data Collection

Based on previous similar studies [2,10,12], researchers designed a structured questionnaire that was used for data collection. A last year dentistry student referred to each dentists' workplace and asked each dentist to fill out all sections of the questionnaire. Two pictures of hypomineralyzed teeth were also given to each dentist to help recognition of MIH condition. The first section of questions recorded demographic data such as age, sex, graduation year, and total years in clinical experience and the dental specialty. The second part of the questionnaire included 11 questions to assess dentists' knowledge and 11 questions to record their clinical experience regarding treatment of MIH teeth. Answering options for knowledge questions were as: True, False, and Do Not Know. Subsequently, each participant was given a knowledge score ranging from 0-11, and the association with demographic variables was determined. The most frequent and less frequent answers to clinical experience questions were also reported using descriptive statistics.

Questionnaire validity check was carried out by 10 dentists who were specialists in operative and pediatric dentistry. Also, before the study, a pilot study was carried out on 60 specialists and general dentists to check the validity and reliability of the questionnaire (alpha Cronbach=0.57). Data from this pilot study was not included in the main study. Test-retest reliability of the questionnaire revealed an inter-class correlation of 0.8. Internal consistency of questions was also assessed (alpha Cronbach=0.57).

Data Analysis

Independent t-test and one-way ANOVA was used for data analysis with IBM SPSS software (version 18.0; SPSS Inc., Chicago, IL, USA) version 20. The level of significance was considered $p<0.05$.

Results

Overall, 400 dentists were included in the study. Table 1 presents the demographic profile of Kerman dentists who were eligible to participate in the study. Among the 400 dentists, 396 completed all parts of the knowledge section of the questionnaire. However, in Table 1, data are presented based on 400 dentists. The mean knowledge score was 6.64 ± 1.9. Minimum and maximum knowledge scores were zero and 10, respectively.

Table1. Demographic characteristics of participants.

Variables	Categories	N (%)
Age	<31 Years	123 (30.7)
	31-40 Years	182 (45.5)
	41-50 Years	47 (11.8)
	>51 Years	44 (11.0)
	Not Answered	4 (1.0)
Gender	Male	235 (58.8)
	Female	161 (40.2)
	Not Answered	4 (1.0)
Place of Dental Clinical Experience	Private Office	166 (41.5)
	Dental Clinic	138 (34.5)

	Both	84 (21.0)
	Not Answered	12 (3.0)
Total Years in Clinical Experience	<6 Years	106 (26.5)
	6-10 Years	151 (37.8)
	11-15 Years	40 (10.0)
	>16 Years	92 (23.0)
	Not Answered	11 (2.7)
Major in Dentistry	General Dentist	327 (81.7)
	Specialist	73 (18.3)

Frequency of responses to MIH knowledge scores is presented in Table 2.

Table 2. Frequency of responses to MIH knowledge questions.

Knowledge Questions	True N (%)	False N (%)	Don't know N (%)
Caries Pattern in MIH Teeth is Different to Caries Pattern in Normal Teeth	317 (79.2)	55 (13.8)	24 (6.0)
MIH is Different to Fluorosis	345 (86.2)	12 (3.0)	43 (10.8)
MIH Prevalence is Higher than 20% in Iranian Children	44 (11.0)	48 (12.0)	308 (77.0)
MIH has Increased Over the Past Ten Years	81 (20.2)	43 (10.8)	276 (69.0)
Global Investigations of MIH Defect is Necessary	329 (82.2)	27 (6.8)	44 (11.0)
Genetic Factors can Influence MIH Defect	314 (78.5)	28 (7.0)	58 (14.5)
Drugs can Cause MIH Defect	314 (78.5)	8 (2.0)	78 (19.5)
Chronic Systemic Diseases can Cause MIH Defect	302 (75.5)	28 (7.0)	70 (17.5)
Acute Systemic Diseases can Cause MIH Defect	254 (63.5)	40(10.0)	106 (26.5)
Fluoride can Cause MIH Defect	162 (40.5)	117 (29.2)	121 (30.3)
Environmental Pollutants can be a Determinant of MIH	203 (50.8)	31 (7.7)	166 (41.50)

As shown in Table 3, female dentists had significantly higher knowledge scores than male dentists ($p<0.05$). Considering age groups, 31-40year-old dentists had higher MIH knowledge score compared to other age groups ($p<0.05$). Also, general dentists' knowledge regarding MIH was significantly higher than specialists in different fields of dentistry ($p<0.05$). According to the results of one-way ANOVA, MIH knowledge score was not different based on place of dental clinical experience and total years of clinical experience. In addition, dentists who graduated from general dentistry during the years 2001-2011 had a higher score of MIH knowledge than those who graduated during the years 2011-2022 and 1991-2001 ($p<0.05$).

Table 3. Dentists' knowledge score based on demographic characteristics.

Variables	N	Mean (SD)	p-value
Gender			
Female	161	7.1 (1.7)	<0.001*
Male	231	6.3 (1.9)	
Age			
<31 Years	119	6.0 (1.9)	<0.001*
31-40 Years	182	7.1 (1.5)	
41-50 Years	47	5.8 (2.4)	
>51 Years	44	7.0 (2.1)	
Major in Dentistry			
General Dentist	326	6.7 (1.9)	0.04*
Specialist Dentist	70	6.2 (1.9)	
Place of Dental Clinical Experience			
Private Office	166	6.8 (1.9)	0.05
Dental Clinic	134	6.6 (2.0)	
Both	84	6 (1.5)	

Years in Clinical Experience			
<6 Years	106	6.6 (1.4)	0.66
6-10 Years	151	6.7 (2.0)	
11-15 Years	40	6.7 (1.2)	
>15 Years	88	6.4 (2.4)	
Graduation From General Dentistry			
1991-2001	43	6.5 (1.8)	0.00*
2001-2011	131	7.3 (1.6)	
2011-2022	186	6.3 (1.8)	

*Statistically significant ($p<0.05$).

Results showed that only 11.8% of dentists had obtained some kind of information about MIH in recent years and half of them (46.5%) used the internet to gain information. During their dental clinical experience, 79.5% of dentists mentioned that they had confronted MIH tooth and most of them (48.8%) referred these patients to specialists for treatment. Most dentists considered the lifespan of the restorative material (58.2%) and the bonding strength of the restorative material (53.4%) in their choice of the type of restorative material for the treatment of teeth with MIH (Table 4).

Table 4. Highest and lowest prevalent responses to dental clinical experience questions regarding MIH condition.

Questions Related to Clinical Experience	Responses	
	Highest Frequency (%)	Lowest Frequency (%)
Have you gained information regarding MIH in recent years?	No (88.3)	Yes (11.8)
If yes, where have you gained this information from?	Internet (46.5)	Retraining (18.9)
In which aspect of MIH, do you feel the most need for clinical education?	All items (49.5)	No (2.8)
Teeth affected with MIH have more clinical problems compared to normal teeth.	I agree (43.5)	I disagree (5.8)
Have you encountered MIH during your clinical experience?	Yes (79.5)	No (20.5)
What is the most difficult part of treating MIH?	Providing aesthetics (43.2)	Providing efficient anesthesia (2.9)
Which factor do you consider most when choosing dental materials for treating MIH condition?	Longevity (58.2)	Recent findings from literature (10.9)
Which dental material do you mostly use for treating MIH condition?	Resin composite (60.9)	Cast restorations (2.1)
How confident are you about the right diagnosis and treatment of MIH condition?	I am not confident but I follow the patient (61.9)	I am completely confident (16.4)
When confronting MIH condition, do you refer patients to a specialist?	Yes (48.8)	No (24.3)
If yes, what are the limitations of treating MIH condition?	Lack of knowledge regarding treatment of MIH condition (54.6)	Problem in achieving efficient local anesthesia (5.9)

Discussion

This study was a census consisting of all eligible general dentists and specialists in different fields of dentistry in the city of Kerman, Iran. Although there have been studies regarding the prevalence and etiology of MIH in Iranian children [20-22], only one study carried out by Bagheri et al. evaluated Iranian dentists' knowledge about this condition and this study was carried out on academic dentists who were specialists in different fields of dentistry and did not include general dentists [16].

The mean knowledge score of dentists was 6.6 out of 11. Therefore, we can assume that dentists' knowledge regarding MIH is still insufficient. Nearly 4 out of every five dentists did not know anything about

the prevalence of MIH in Iranian children and most respondents thought that it was higher than 20%. Nevertheless, most studies in Iran have revealed the prevalence of MIH less than 20% [21-25]. And others have obtained prevalence rates extremely near to 20% [20,22,26]. Based on a study on Indian dentists, the prevalence of this condition was thought to be less than 10% in India [14,27,28]. Only in recent years, the MIH condition is mentioned as a developmental defect in most dentistry textbooks and before that, this condition might have been misdiagnosed with caries. Therefore, it seems that differential diagnosis between dental caries and MIH is a problem for Iranian dentists, resulting in higher estimates of the condition.

Considering MIH etiology, most dentists had consensus regarding genetics, drugs and systemic diseases as influencing factors of MIH. A large percentage of them considered the condition as being different from fluorosis but surprisingly, about half of them believed that fluoride could be an etiologic factor of MIH. Research in other countries revealed similar results; for example, Upadhyay et al. [14] reported that Indian dentists showed disparity about the etiologic factors associated with MIH and about 15% of them considered fluoride as an etiologic factor. In Kerman, natural fluoride level in water is high [29], and the similar clinical appearance of fluorosis and MIH [30] can be the reason for considering MIH as a factor related to fluorosis. This further reveals the need for educating dentists about differences between MIH condition and other developmental enamel defects like fluorosis.

As mentioned above, high diversity was seen in dentists' knowledge of MIH. The other study carried out in Iran also reported that academic specialist dentists presented high diversity regarding MIH knowledge about the prevalence and clinical manifestations of the condition [16]. Dentists who are in practice in Kerman or any other city are graduated from different dental schools across Iran or even from other countries, and due to different educational policies, have different knowledge levels of this topic. Studies from other parts of the world have also confirmed this finding. For example, members of the Australian dental pediatric community, mostly pediatric dentists and general dental practitioners, presented diverse information regarding the etiology of MIH. Also, less than a fifth had correct knowledge about the condition's prevalence, despite existing information in the country. Likewise, Chilean oral health care providers did not reveal a consensus about MIH prevalence and clinical management [10,18].

In the present study, female dentists had more information about MIH than male dentists, which was in line with what Gambetta-Tessini et al. [10] concluded. Likewise, dentists 31-40 years old had the highest knowledge level compared to other age groups. Unexpectedly, general dentists' knowledge regarding MIH was higher than dental specialists. While, according to what Alanzi et al. [2] revealed, the perception and knowledge of general dentists regarding MIH was lower than that of specialists. Many dental specialists like orthodontists may never encounter the need for treating MIH affected teeth due to the irrelevant treatment specialty, whereas other specialists like pediatric dentists or endodontics may be faced with this defect more frequently. Nevertheless, general dentists visit a wide range of patients and are more likely to encounter MIH affected teeth. This could motivate them to acquire more information about this condition contributing to higher knowledge scores compared to specialists as a whole group. Still, more research is needed to confirm this as the findings of the literature show disparity.

This study showed that most dentists had not obtained new information about MIH in recent years and about half of those had referred to the internet as an information source. Alanzi et al. [2] also confirmed that the internet was the most used source for retrieving information in general dentists. Meanwhile, specialists tended to refer to journals for obtaining new information.

Half of participants claimed that they needed education in all aspects of MIH. Almost in line with this finding, a much higher percentage of Indian dentists (88%) stated that they needed more education regarding MIH management [9].

In this research, about four of every five dentists had encountered MIH during their clinical experience. The other study performed on Iranian academic dentists similarly reported that 85% of dentists had faced this defect in their clinical practice [16]. The study, which was carried out on 1500 Indian dentists, revealed that nearly all had encountered MIH during their years of clinical practice and nearly 9 out of ten believed that the management was challenging [14]. Based on Kerman dentists' report in this study, providing esthetics was considered the most challenging MIH treatment procedure. Meanwhile, providing sufficient local anesthesia was not a widely reported challenge in this study. Among Indian dentists, providing long-term restorations was considered the most difficult part of MIH management, whereas providing local anesthesia was reported a challenge in 7% of them [14].

Regarding treatment, resin composite was the most commonly used dental material and longevity was considered the most important characteristic for choosing a dental material. Iranian academic dentists of Shiraz and Tehran also used resin composite for the treatment of MIH affected teeth. This dental material was especially used by pediatric dentists, and endodontists and adhesion to tooth surface was the most highly considered factor for material choice [16]. Alanzi et al. [2] reported that in Kuwait, dentists used resin composite, and in severe cases, a preformed metal crown was preferred. Slightly different from our results, Spanish dentists tended to choose Resin modified glass ionomer to treat MIH. Whereas for anterior affected teeth, resin composite was most commonly used. When choosing dental material for MIH treatment, durability and the potential to remineralize tooth structure was considered most [3]. Hussein et al. [7] also claimed that glass ionomer was the material of choice for MIH treatment. Meanwhile, German dental students thought that the material of choice for treatment of MIH was resin composite and metal crowns [15].

Finally, a high percentage of dentists reported not being confident about diagnosing MIH and most of them believed to have a lack of knowledge regarding the condition. Elhennawy et al. [15] also reported that only 16% of dental students in Germany were confident regarding MIH diagnosis. In Kuwait, Alanzi et al. [2] claimed that dentists were not confident in diagnosing MIH. Meanwhile, specialists presented more confidence in diagnosing MIH compared to general dentists.

Overall, it seems that a large proportion of dentists encounter MIH affected teeth during their clinical practice, most of which require more education and training. Even when diagnosed, the treatment is still challenging for dentists. Therefore, dental students should be provided with more training of MIH management and diagnosis. Also, continuing education courses would help dentists obtain new information on the condition.

This was a cross-sectional study, and any association between MIH and other factors have to be confirmed through longitudinal research. More research has to be carried out to specify different aspects of MIH that dentists have a low knowledge level. Also, if different specialties are compared separately in larger sample sizes, a better view would be provided into determining target groups in need of more training.

Conclusion

Dentists in Kerman did not have enough knowledge of MIH prevalence and there was some misunderstanding regarding some etiologic factors. Nevertheless, most of them had encountered this defect

during their clinical practice and required education on all aspects of MIH diagnosis and management. Also, younger dental practitioners, general dentists and females presented higher knowledge of MIH condition.

Authors' Contributions

FSS	https://orcid.org/0000-0002-5855-6533	Conceptualization, Methodology, Investigation, Data Curation and Writing - Review and Editing.
NH	https://orcid.org/0000-0001-9411-898X	Writing - Original Draft and Writing - Review and Editing.
AM	https://orcid.org/0000-0002-6865-7565	Data Curation.
AE	https://orcid.org/0000-0002-2982-2441	Methodology, Formal Analysis and Writing - Review and Editing.
MR	https://orcid.org/0000-0003-4935-1859	Data Curation and Writing - Review and Editing.

All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

Financial Support

This study was financially supported by Kerman University of Medical Sciences (Grant No. 98000667).

Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

References

[1] Weerheijm K, Jälevik B, Alaluusua S. Molar-incisor hypomineralisation. Caries Res 2001; 35(5):390-1. https://doi.org/10.1159/000047479

[2] Alanzi A, Faridoun A, Kavvadia K, Ghanim A. Dentists' perception, knowledge, and clinical management of molar-incisor-hypomineralisation in Kuwait: a cross-sectional study. BMC Oral Health 2018; 18(1):34. https://doi.org/10.1186/s12903-018-0498-2

[3] Serna-Muñoz C, Martinez-Beneyto Y, Pérez-Silva A, Poza-Pascual A, Ibáñez-López FJ, Ortiz-Ruiz AJ. Perception, knowledge, and attitudes towards molar incisor hypomineralization among Spanish dentists: a cross-sectional study. BMC Oral Health 2020; 20(1):260. https://doi.org/10.1186/s12903-020-01249-6

[4] Silva MJ, Scurrah KJ, Craig JM, Manton DJ, Kilpatrick N. Etiology of molar incisor hypomineralization - A systematic review. Community Dent Oral Epidemiol 2016; 44(4):342-53. https://doi.org/10.1111/cdoe.12229

[5] Giuca MR, Cappè M, Carli E, Lardani L, Pasini M. Investigation of clinical characteristics and etiological factors in children with molar incisor hypomineralization. Int J Dent 2018; 2018:7584736. https://doi.org/10.1155/2018/7584736

[6] de Lima Mde D, Andrade MJ, Dantas-Neta NB, Andrade NS, Teixeira RJ, de Moura MS, et al. Epidemiologic study of molar-incisor hypomineralization in schoolchildren in North-eastern Brazil. Pediatr Dent 2015; 37(7):513-9.

[7] Hussein A, Ghanim A, Abu-Hassan M, Manton D. Knowledge, management and perceived barriers to treatment of molar-incisor hypomineralisation in general dental practitioners and dental nurses in Malaysia. Eur Arch Paediatr Dent 2014; 15(5):301-7. https://doi.org/10.1007/s40368-014-0115-2

[8] Elzein R, Chouery E, Abdel-Sater F, Bacho R, Ayoub F. Molar incisor hypomineralisation in Lebanon: prevalence and clinical characteristics. Eur Arch Paediatr Dent 2020; 21(5):609-16. https://doi.org/10.1007/s40368-019-00505-w

[9] Rao MH, Aluru SC, Jayam C, Bandlapalli A, Patel N. Molar Incisor Hypomineralization. J Contemp Dent Pract 2016; 17(7):609-13.

[10] Gambetta-Tessini K, Marino R, Ghanim A, Calache H, Manton D. Knowledge, experience and perceptions regarding Molar-Incisor Hypomineralisation (MIH) amongst Australian and Chilean public oral health care practitioners. BMC Oral Health 2016; 16(1):75. https://doi.org/10.1186/s12903-016-0279-8

[11] Schwendicke F, Elhennawy K, Reda S, Bekes K, Manton DJ, Krois J. Global burden of molar incisor hypomineralization. J Dent 2018; 68:10-8. https://doi.org/10.1016/j.jdent.2017.12.002

[12] Dantas-Neta NB, Moura LdFAdD, Cruz PF, Moura MS, Paiva SM, Martins CC, et al. Impact of molar-incisor hypomineralization on oral health-related quality of life in schoolchildren. Braz Oral Res 2016; 30(1):e117. https://doi.org/10.1590/1807-3107BOR-2016.vol30.0117

[13] Rodd HD, Graham A, Tajmehr N, Timms L, Hasmun N. Molar incisor hypomineralisation: current knowledge and practice. Int Dent J 2020. https://doi.org/10.1111/idj.12624.

[14] Upadhyay S, Kumar G, Dhillon JK, Gill NC. Perception of Indian dental surgeons regarding molar incisor hypomineralization. Int J Clin Pediatr Dent 2018; 11(2):116-21. https://doi.org/10.5005/jp-journals-10005-1496

[15] Elhennawy K, Anang M, Splieth C, Bekes K, Manton DJ, Hedar Z, et al. Knowledge, attitudes, and beliefs regarding molar incisor hypomineralization (MIH) amongst German dental students. Int J Paediatr Dent 2020. https://doi.org/10.1111/ipd.12715

[16] Bagheri R, Ghanim A, Azar MR, Manton DJ. Molar incisor hypomineralisation: discernment a group of Iranian dental academics. J Oral Health Oral Epidemiol 2014; 3(1):21-9.

[17] Weerheijm KL, Mejàre I. Molar incisor hypomineralization: a questionnaire inventory of its occurrence in member countries of the European Academy of Paediatric Dentistry (EAPD). Int J Paediatr Dent 2003; 13(6):411-6. https://doi.org/10.1046/j.1365-263x.2003.00498.x

[18] Crombie F, Manton D, Weerheijm K, Kilpatrick. Molar incisor hypomineralization: a survey of members of the Australian and New Zealand Society of Paediatric Dentistry. Aust Dent J 2008; 53(2):160-6. https://doi.org/10.1111/j.1834-7819.2008.00026.x

[19] Ghanim A, Morgan M, Marino R, Manton D, Bailey D. Perception of molar-incisor hypomineralisation (MIH) by Iraqi dental academics. Int J Paediatr Dent 2011; 21(4):261-70. https://doi.org/10.1111/j.1365-263X.2011.01118.x

[20] Ghanim A, Bagheri R, Golkari A, Manton D. Molar–incisor hypomineralisation: a prevalence study amongst primary schoolchildren of Shiraz, Iran. Eur Arch Paediatr Dent 2014; 15(2):75-82. https://doi.org/10.1007/s40368-013-0067-y

[21] Ahmadi R, Ramazani N, Nourinasab R. Molar incisor hypomineralization: a study of prevalence and etiology in a group of Iranian children. Iran J Pediatr 2012; 22(2):245-51.

[22] Salem K, Azarbaan S. An Investigation of the Prevalence and predictive factors of molar-incisor hypomineralization in Rasht, Iran. J Mashhad Dent Sch 2017; 41(1):31-40.

[23] Poureslami H, Shojaiepour R, Abbaspour S, Aminizadeh M, Khademi M, Abbaspour S. Prevalence of the molar incisor hypomineralization in seven to twelve-year-old students of Kerman, Iran, in 2015-2016. J Oral Health Oral Epidemiol 2017; 7(1):21-7. https://doi.org/10.22122/johoe.v7i1.389

[24] Shojaeepour S, Jalali F, Shokrizadeh M, Riahi Madvar R, Torabi-Parizi M, Shojaeipour R. Assessing the prevalence of molar-incisor hypomineralization and its effects on oral health-related quality of life in children aged 8-12 years in the city of Kerman, Iran. J Oral Health Oral Epidemiol 2020; 9(3):143-8. https://doi.org/10.22122/johoe.2020.192030.1081

[25] Salem K, Daryoush A, Asadi M. Prevalence and predictors of molar incisor hypomineralization (MIH) among rural children in northern Iran. Iran J Public Health 2016; 45(11):1528-30.

[26] Bahrololoomi Z, Amrollahi N, Mostafaloo N. The Prevalence and Extent of Molar-Incisor Hypo-Mineralization by Gender in a Group of Iranian Children. Iran J Public Health 2020; 49(8):1585-7. https://doi.org/10.18502/ijph.v49i8.3911

[27] Bhaskar SA, Hegde S. Molar-incisor hypomineralization: Prevalence, severity and clinical characteristics in 8-to 13-year-old children of Udaipur, India. J Indian Soc Pedod Prev Dent 2014; 32(4):322-9. https://doi.org/10.4103/0970-4388.140960

[28] Kirthiga M, Poornima P, Praveen R, Gayathri P, Manju M, Priya M. Prevalence and severity of molar incisor hypomineralization in children aged 11-16 years of a city in Karnataka, Davangere. J Indian Soc Pedod Prev Dent 2015; 33(3):213-7. https://doi.org/10.4103/0970-4388.160366

[29] Pooreslami H, Khazaeli P, Masoodpoor H. Fluoride content of drinking waters in Kerman/Iran. J Kerman Univ Medical Sci 2008; 15(3):235-42.

[30] Wright JT. Diagnosis and Treatment of Molar-Incisor Hypomineralization. In: Soxman JA. Handbook of Clinical Techniques in Pediatric Dentistry. London: John Wiley & Sons, Inc; 2015. Chapter 5. pp. 99-106. https://doi.org/10.1002/9781118998199.ch12