

Supplementary Table S1. Summary of key findings from the literature reviewed (N = 21)

Author and year	Country	Study design	Number of participants	Objectives	Results	Conclusions
Crombie et al. (2008) ⁹	Australia	Cross-sectional	130	To ascertain the knowledge and opinions regarding MIH of Australian dental care providers.	98.5% were familiar with MIH; 95.4% encountered it in practice. 53.1% reported an increase in MIH cases, while 26.2% were unsure, and 20.0% saw no increase. Only 16.9% knew of Australian prevalence data, but 96.9% felt it should be investigated. 96.9% of clinicians reported clinical challenges. Common issues: aesthetics, defining cavity margins, and restoration longevity. Glass ionomer cements (GIC) (81.7%) and composite resin (73%) were widely used, while resin-modified GIC, compomer, flowable composite, amalgam, and cast restorations were less common. Preformed crowns were more frequently used by pediatric dentists and postgraduate students.	MIH is widely recognized and poses significant clinical challenges, especially in providing high-quality restorative care. Knowledge and opinions on its prevalence, etiology, and management vary, with most respondents showing limited understanding of MIH prevalence but supporting further research.
Gambetta-Tessini et al. (2016) ⁶	Australia	Cross-sectional	232	To compare the knowledge, clinical experience, and perceptions regarding MIH of Australian and Chilean oral health care practitioners from the public dental sector.	88.6% of respondents had observed MIH in their patients; level of knowledge of MIH was high in Australian participants ($p = 0.03$). Australian respondents felt more confident when diagnosing (OR 8.80, 95 % CI 2.49–31.16) and treating MIH-affected children (OR 4.56, 95 % CI 2.16–9.76) compared to Chilean respondents. Oral health therapists reported higher levels of confidence than Australian general dental practitioners when providing treatment to children with MIH (OR 7.53; 95 % CI 1.95–29.07).	Updating clinical guidelines can enhance practitioners' ability to diagnose and treat MIH-affected children. Raising awareness and disseminating information about MIH, especially among general dental practitioners in public clinics in Chile, is crucial.
Ghanim et al. (2019) ⁴²	Australia	Validation	Not applicable	To explore the reproducibility and validity of a new instrument developed to assess MIH.	The index confirmed the hypothesized associations with the presence, prevalence, and severity of MIH, demonstrating strong construct validity. Researchers found the codes and definitions to be clear and appropriate for international use. It showed satisfactory sensitivity, specificity, and PPV/NPV scores. Examiners reached "Substantial" to "Almost perfect" agreement levels in assessing clinical presentation and lesion extent.	The index demonstrated solid properties, offering confidence in its reliability and validity for use in both population-based and clinical screenings for diagnosing MIH and other enamel defects.

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Rodd et al. (2021) ⁴¹	United Kingdom	Review	Not applicable	To provide an up-to-date review of the epidemiology, etiology, diagnosis, and clinical management of MIH.	Evidence on MIH is expanding, with current research focusing on potential genetic factors and the development and validation of diagnostic indices for its management. There is growing recognition of both the global and individual impact of this common condition.	Oral health professionals should review the latest basic science and clinical literature on MIH to ensure they provide the best possible care for their young patients.
Skaare et al. (2021) ⁷	Norway	Cross-sectional	100	To gather baseline information on knowledge, perceptions, clinical experience, and treatment options regarding MIH among oral care providers in Oslo, Norway.	All respondents (n = 100) encountered MIH in practice, with varying perceptions of its prevalence in Oslo. Most felt confident diagnosing MIH (86%), especially those qualified in the last 10 years ($p = 0.016$). While 68.3% were confident in treatment, 88% viewed MIH as a clinical challenge. Treatment approaches varied, with difficulties in local anesthesia (71.4%) and child behaviour (84.1%) as barriers. About 69% sought further training, particularly on MIH etiology (70%), diagnosis (57%), and treatment (77%).	All clinicians were familiar with the diagnosis of MIH and experienced the condition as a clinical problem. Continuing education on etiology, diagnosis, and treatment of MIH was requested.
Butera et al. (2021) ³⁰	Italy	Review	Not applicable	To review studies that investigated possible associations between genetic factors or prenatal, perinatal, and postnatal causes and enamel defects.	Twenty-five articles were included. SNPs expressed during the secretion or maturation stages of amelogenesis showed statistical relevance in 16% of studies and 80% of those investigating these factors. Postnatal factors showed statistical significance, including breastfeeding period (2%), asthma (16%), high fever (20%), infections/illnesses (20%), chickenpox (12%), antibiotic use (8%), diarrhea (4%), and pneumonia (4%).	The results support the multifactorial etiology of dental enamel defects. Further studies with larger, well-diagnosed, and ethnically diverse populations are needed to better understand the genetic and environmental factors that may influence the occurrence of deciduous molar hypomineralization), hypomineralized primary second molars, and MIH.

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Dian et al. (2022) ¹⁶	Indonesia	Cross-sectional	266	To evaluate the knowledge and perception of MIH among general dental practitioners (GD), pediatric dentists (PD), and other dental specialists (DS) in Indonesia using a self-administered questionnaire.	Significant differences were found in overall knowledge scores between GD, PD, and DS ($p < 0.001$), particularly regarding the caries pattern associated with MIH and its etiology. Most PD (83.3%) could distinguish MIH-related caries from the classic pattern. PD showed higher confidence in diagnosing and treating MIH compared to GD and DS ($p = 0.000$). Across all groups, the majority agreed on the need for continuing education on MIH, covering etiology, diagnosis, and treatment, to enhance their knowledge and confidence in clinical management.	Oral care providers, especially GD and DS, need further training and education on MIH to improve their confidence in managing affected patients. Sharing the latest MIH information with GD, as primary care providers in Indonesia, is essential for accurate diagnosis and proper treatment.
Seremidi et al. (2022) ¹¹	Greece	Cross-sectional	360	To record knowledge and attitudes of Greek dentists regarding diagnosis and treatment of MIH and correlate findings with non-dental characteristics.	185 general dental practitioners (GDP) and 175 specialists (59 pediatric dentists [PD], 38 orthodontists, 78 from other specialties). MIH was frequently encountered, with GDP more likely than PD to cite genetics and fluoride intake as causes ($p < 0.05$). Permanent molars and incisors (44%) were most affected, with yellow/brown demarcated opacities (68%) being the most common feature, more often reported by PD ($p < 0.05$). Dentists treating over 10 children weekly were 2 to 5.5 times more likely to experience anesthesia difficulties and hypersensitivity. While GDP and specialists agreed on less invasive treatments for anterior lesions, non-PD preferred bulk-fill restorations or onlays for severely affected posterior teeth, whereas PD favoured preformed metal crowns ($p < 0.05$). Clinician age, experience, and number of children treated per week significantly influenced treatment decisions for severely affected posterior teeth.	Most participants had encountered MIH in their clinical practice and could identify the primary etiological factors and clinical features associated with the condition. However, their knowledge of treatment options was limited.

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Karkoutly et al. (2022) ¹²	Syria	Cross-sectional	703	To evaluate and compare the knowledge, perceptions, attitudes, and clinical experiences of MIH among general dental practitioners and pediatric dentists in Syria.	Pediatric dentists showed significantly greater familiarity with MIH ($p < 0.001$) and confidence in diagnosing it ($p < 0.001$). Most participants (43.95%) reported an increase in MIH prevalence in Syria. Stainless steel crowns were the preferred restorative material for molars with PEB (51.38%), while composite resin was favored for molars and incisors with opacities (41.82% and 67.51%, respectively). General dental practitioners expressed a need for further training in MIH treatment ($p < 0.001$).	Pediatric dentists had more knowledge and confidence in diagnosing MIH, while general practitioners need further training. Most noted an increase in MIH cases, though Syrian prevalence data is limited. Stainless steel crowns and composite resin were the preferred restorative materials.
Dian et al. (2022) ¹⁰	Indonesia	Cross-sectional	145	To analyze knowledge and perception in undergraduate clinical stage and pediatric dentistry postgraduate dental students in Indonesia.	There was a statistically significant difference in knowledge scores between undergraduate and postgraduate students ($p < 0.05$), with scores of 45.1 ± 6.6 and 51.2 ± 5.4 , respectively. Most postgraduate students (88.7%) recognized that the caries pattern associated with MIH differs from the classic caries pattern, while only 42.2% of undergraduate students were aware of this distinction. Additionally, 67.5% of undergraduate students expressed a lack of confidence in treating MIH. Almost all students from both groups desired further training on MIH.	MIH knowledge among Indonesian dental students needs improvement due to limited exposure, raising concerns for future practice. Adding MIH to the curriculum is key to building confidence in diagnosis and management.

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Gómez-Clavel et al. (2023) ¹³	Mexico	Cross-sectional	391	To evaluate the knowledge, experience, and perceptions of dental surgeons regarding the detection, assessment, and treatment of MIH in the metropolitan area of Mexico City.	86% of participants identified MIH lesions, with 84% reporting they had observed them in practice. The most observed lesions were yellow-brown opacities (47%), followed by white opacities (46%), while post-eruptive fractures accounted for only 7% of cases. The primary challenge in managing MIH-affected teeth was a lack of training for treating children with this condition. Additionally, 84% of dentists expressed a desire for more information on treating MIH lesions.	Most of the surveyed dentists recognized MIH and reported having observed MIH lesions in their practice. Most of the dentists indicated that the main problem for the management of the MIH is the lack of training.
Gunay (2023) ¹⁷	Turkey	Cross-sectional	218	To evaluate the knowledge, attitudes, and practices of fourth- and fifth-year dental students about MIH.	A statistically significant difference was observed between fourth-year students (68.5%) and fifth-year students (98.1%) regarding prior awareness of the term MIH ($p < 0.001$). While most students recognized the clinical features of MIH, only 26.1% felt confident in their ability to diagnose it. A significant difference was noted between fourth- and fifth-year students in their perception of MIH as a clinical issue, particularly concerning aesthetic problems and the ability to provide adequate restorations ($p = 0.012$).	While most students had theoretical knowledge of MIH, they lacked confidence in their diagnostic abilities and struggled to differentiate it from other dental anomalies. However, fifth-year students demonstrated greater awareness compared to their fourth-year counterparts.
Afzal et al. (2023) ²⁷	Norway	Longitudinal	3013	To investigate the prevalence and factors associated with MIH in 8- and 9-year-old children in Oslo.	MIH prevalence was 28.2%, with no gender differences. Higher prevalence was seen in children who had early-life illnesses or whose mothers were ill during pregnancy, though no link was found with prematurity or maternal medication use. Multivariable analysis showed children with MIH were more likely to have had early illnesses (OR = 1.41), used antibiotics in their first year (OR = 1.68), experienced tooth pain (OR = 1.33), and felt pain during brushing (OR = 2.17).	The prevalence of MIH was high in the children in the present study. Among the possible etiological factors investigated, illness in early childhood and use of antibiotics during the first year of life were associated with MIH.

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Hajdarević et al. (2024) ¹⁹	Sweden	Cross-sectional	357	To investigate attitudes and preferred therapy for FPM with MIH among orthodontists and dentists.	Orthodontists and pediatric dentists were more likely than general dentists to extract FPM with moderate to severe MIH. Resin composite was the preferred material for restoring FPM with moderate MIH, while pediatric dentists more often used GIC for severe cases. Fluoride varnish was commonly used for mild MIH. The ideal time for extracting FPM with severe MIH was during root furcation development in the second molar, with general dentists frequently relying on pediatric dentists' recommendations.	Extraction of FPM with moderate and severe MIH is considered a therapy of choice among general dentists and specialists, and the preferred time of extraction is before the eruption of the second permanent molar.
Da Costa Rosa et al. (2024) ¹⁴	Brazil	Cross-sectional	100	To evaluate perceptions, attitudes, and clinical experience of Brazilian oral health practitioners regarding MIH.	Most private practitioners had 21 to 30 years of experience (28%) and master's degrees (50%), while public practitioners had 11 to 20 years of experience (32%) and PhDs (32%). MIH was recognized by 86%, with significant sector differences in MIH frequency ($p = 0.001$), incidence ($p = 0.039$), and lesion type ($p = 0.043$). Half of public practitioners reported uncertainty in managing MIH. For mild MIH in incisors, 43% chose no treatment, while fissure sealant was preferred for first molars (51%). Glass ionomer was used for severe MIH with moderate loss (38%), and endodontics with preformed crowns for extensive damage.	Brazilian oral health practitioners frequently encounter MIH in clinical practice. While public sector professionals report lower confidence in diagnosing and treating the condition, no significant differences were found in treatment preferences between public and private sector practitioners.
Papanikolaou et al. (2025) ¹⁵	Netherlands	Cross-sectional	231	To assess the knowledge of and attitudes towards the management of MIH among dentists in the Netherlands.	Of the respondents, 76.6% were general dental practitioners, 9.1% pediatric dentists, and 14.3% specialists, with an overall response rate of 25.6%. Most were familiar with MIH, its clinical features, and could differentiate it from other enamel defects. 76.6% believed in a genetic component. For asymptomatic cases, 47.3% opted for non-invasive treatments, while in mild symptomatic cases, treatments ranged from non-invasive to invasive ($p < 0.05$). In severe cases, most chose invasive treatments. Two-thirds expressed interest in further clinical training on MIH.	Respondents had adequate knowledge of MIH and its treatment, though differences were seen in managing mild symptomatic cases. All favoured minimally invasive approaches. Ongoing education and evidence-based guidelines could improve care for MIH patients.

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Afzal et al. (2024) ⁴⁶	Norway	Cross-sectional	3013	To examine the distribution and severity of MIH in 8- and 9-year-olds and explore its association with hypersensitivity, caries, and involvement of incisors and SPM.	46.8% of children with MIH had at least 1 severely affected molar, while 51.9% had affected incisors, with a higher prevalence in those with severe MIH (57.4%, $p < 0.01$). Second primary molars were affected in 29.6% of MIH cases, hypersensitivity in at least 1 FPM was reported by 25.8%, and 30.8% had caries extending to dentine. Children with severe MIH were significantly more likely to experience hypersensitivity (OR 5.62, 95% CI 3.61–8.74) and dentine caries (OR 10.32, 95% CI 6.46–16.50) than those with mild MIH.	The prevalence of hypomineralized incisors and HSPM was high in children with MIH. Those with severe MIH were more likely to have affected incisors, dentine caries, and hypersensitivity compared to those with mild cases. These findings emphasize the need for further research on effective preventive strategies and treatments for MIH.
Da Costa Rosa et al. (2024) ²⁰	Brazil	Cost-effectiveness	Not applicable	Conduct a cost-effectiveness analysis of restorative treatments for FPM with severe MIH in the Brazilian public health system.	Cost-effective treatments included HVGIC, encapsulated GIC, and encapsulated GIC combined with etch-and-rinse adhesive and composite at 1 year and 10 years, respectively. The benefit gained from using encapsulated GIC with etch-and-rinse adhesive and composite compared to encapsulated GIC alone was minimal relative to the cost increase: at 1 year, there was a 3.28% gain with an additional cost of USD 24.26; at 10 years, the gain was 4% with a cost increase of USD 15.54.	Within the horizon and perspective analyzed, the most cost-effective treatment was encapsulated GIC restoration.
Tarazona-Valero et al. (2024) ¹⁸	Spain	Cross-sectional	290	To assess dental and dental hygiene students' knowledge of MIH and identify the need for curricular updates and standardized clinical guidelines.	Of 290 questionnaires collected, 53.8% were from second-year oral hygiene students and 46.2% from dental degree students. 75.2% had heard of MIH, primarily through master classes, but 58.3% struggled to differentiate MIH lesions from other types. Dental students demonstrated greater knowledge about MIH in all areas assessed: prevalence, diagnosis, prevention, and treatment. Additionally, 83.8% of students expressed interest in further training on MIH, particularly in diagnosis and treatment.	The findings of this study highlight the necessity to enhance both theoretical and practical content on MIH in the curricula of dentistry degree programs and integrated vocational training centres in Spain.

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Mafla et al. (2024) ³⁵	Colombia	Cross-sectional	384	To assess the association between stress, depression, and anxiety in pregnancy and the presence of MIH in children at a later age.	The prevalence of MIH was 33.3%, with 12.8% of participants showing hypomineralization in both molars and incisors. DAG analysis and logistic regression revealed that the presence of MIH was associated with symptoms of maternal depression (OR _{adj} = 3.26, 95% CI: 1.92–5.52, $p < 0.001$), while hypomineralization in both molars and incisors was linked to symptoms of maternal anxiety (OR _{adj} = 3.49, 95% CI: 1.80–6.76, $p < 0.001$).	Psychological factors, among others, were significantly associated with the presence of MIH.
Ortega-Luengo et al. (2024) ²⁸	Spain	Cross-sectional	489	To estimate the prevalence of MIH among children using primary care services in the community of Madrid, Spain.	The prevalence of MIH was 28.63% (CI: 24.61–32.65%). The age groups most affected were 8 years (21.4%) and 11 years (20.7%), with a higher prevalence in girls (60.71%) compared to boys (39.28%). On average, each patient had 4.46 ± 2.8 affected teeth. The upper right first molar was the most commonly affected tooth (74.3%), while the upper left central incisor was the most affected incisor (37.85%). Opacities were the most frequently recorded defects (63.57%).	MIH prevalence was the highest in Spain, mainly affecting females ages 8 to 11. Opacities were the most common lesions, with less than one-third of the tooth surface affected. Molars often had brown defects, while incisors showed white or yellow defects. Longitudinal studies and awareness programs for primary health care personnel are needed.

CITATION

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