Original Research Article

Knowledge perspective and clinical judgement of dentists towards amelogenesis imperfect: A descriptive-analytical, cross-sectional study

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Abstract

Background: Amelogenesis imperfecta (AI) is a rare genetic condition affecting enamel formation, leading to functional, aesthetic, and psychosocial challenges such as anxiety, low self-esteem, and social withdrawal. Proper management requires not only clinical intervention but also psychological support to enhance the overall quality of life of affected individuals.

Aim & Objective: The aim of this study was to assess the knowledge, perspectives, and clinical judgment of dental professionals and students in Kerala regarding Amelogenesis imperfecta (AI), with special emphasis on its psychosocial impact and management strategies.

Materials and Methods: A cross-sectional, survey-based study was conducted among dental professionals and students across Kerala using a structured Knowledge, Attitude, and Practice (KAP)-based questionnaire. The tool was designed to assess the participants' understanding of AI, its clinical manifestations, psychosocial impacts, and current management approaches. Data were analyzed using Microsoft Excel and SPSS software.

Results: The results revealed notable gaps in participants' knowledge, particularly concerning the psychosocial aspects of AI. While awareness regarding clinical features and prosthodontic management was relatively adequate, understanding of the psychological needs and social challenges faced by AI patients was insufficient.

Conclusion: The findings highlight the necessity of enhancing dental education and training programs to include the psychosocial dimensions of AI. Strengthening professional development in this area is essential for delivering comprehensive, patient-centered care and improving the life quality of individuals with AI.

Keywords: Amelogenesis imperfecta, Psychosocial impact, Prosthodontic management, Clinical judgment, Dental professionals.

1. Introduction

A confident smile fosters social connections and self-assurance, playing a vital role in psychological and social well-being. However, for individuals with Amelogenesis imperfecta (AI), this basic expression is often fraught with challenges.[1,2] AI is a rare hereditary disorder affecting enamel formation, leading to weakened, discoloured teeth in both primary and permanent dentitions.[3] This condition extends beyond aesthetics, as brittle enamel predisposes patients to hypersensitivity, increased cavity risk, poor chewing efficiency, and bite discrepancies. Structural abnormalities, including taurodontism, malformed roots, and anterior open bites, further impair oral functions and necessitate sophisticated, multidisciplinary clinical management.[4] Dental anomalies are highly visible and often result in social scrutiny, emotional distress, and low self-esteem, especially among children and adolescents.[5] These psychosocial challenges significantly influence self-perception and social participation, reinforcing the necessity for integrated psychological and clinical care. Studies emphasize the need for early diagnosis and individualized intervention to address the interconnected physical and emotional difficulties.[6,7] Despite advancements, a lack of awareness about psychosocial impacts among dental professionals persists.[8]

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This study investigates the awareness, clinical judgment, and perspectives of dental professionals in Kerala regarding AI. By identifying gaps in knowledge and practice, it aims to improve future dental education and enhance holistic patient care.

2. Materials and Methods

This cross-sectional study involved 471 dental professionals from Kerala, including students, interns, and practicing dentists. Participants were selected through convenience sampling and completed an online questionnaire distributed via WhatsApp. The 10-item questionnaire was based on the Knowledge, Attitude, and Practice (KAP) framework, focusing on clinical features, diagnosis, treatment options, and psychosocial aspects of AI. The questions were dichotomous (Yes/No), with scoring designed to measure awareness and understanding. Responses were analysed using SPSS software (version 23) to identify patterns and correlations across different experience levels.

Table 1: Presents the distribution of respondents based on their professional status

Parameter	No.	%
Final year students	147	31.2
Interns	172	36.6
PG students	43	9.1
BDS with < 5 year experience	61	12.9
BDS with > 5 year experience	18	3.9
MDS with < 5 year experience	16	3.4
MDS with > 5 year experience	14	2.9

A set of 10 structured questions was developed using Google sheet and distributed through WhatsApp groups, and responses were recorded and analysed using SPSS software.

3. Results

Table 2: Outlines the distribution of responses

			Percent
No.	Yes	No	Yes
1. I can confidently identify a patient with Amelogenesis imperfecta.	411	60	87.3%
2. I am familier with the clinical signs and symptoms of Amelogenesis imperfecta.	415	56	88.1%
3. I am aware of the following aspects of Amelogenesis imperfecta.			
i. Craniofacial deformity (Retrognathic mandible, increased vertical jaw relationship, higher value of gonial angle)	200	271	83%
ii. Dental malocclusion (Anterior or posterior open bites, crossbites, brittle teeth, hypersensitivity)	391	80	42.5%
iii. Psychosocial damage due to compromised aesthetics.	312	159	66.2%
4. I understand that patients with Amelogenesis imperfecta may experience the following psychosocial problems.			
i. Lack of self esteem	282	189	59.9%
ii. Lack of confidence	398	73	84.5%
iii. Negative thoughts	241	230	51.2%
iv. Social avoidance.	220	251	46.7%
5. I find it challenging to differentiate AI from the following conditions.			
i. Dentinogenesis imperfecta	117	354	24.8%
ii. Dental fluorosis	213	258	45.2%
iii. Enamel hypoplasia	283	188	60.1%
iv. Molar incisor hypomineralization.	8	463	1.7%
6. In my opinion the ideal time to initiate treatment for AI patients is during:			
i. Deciduous dentition	181	290	38.4%
ii. Mixed dentition	111	360	23.6%
iii. Permanent dentition.	179	292	38%
7. I believe the correction of malocclusion in AI patience is preferably			
i. Myofunctional appliance in children's	279	192	59.2%
ii. Clear aligners	203	268	43.1%
iii. Surgical orthodontics	53	418	11.3%
iv. Fixed orthodontics	156	315	33.1%

| **Table 2 Continued…**			
8. I understand the modalities of counseling that are given to AI patients include			
i. Parents counseling	27	444	5.7%
ii. Diet counseling	26	445	5.5%
iii. Psychosocial counseling	26	445	5.5%
iv. All of the above	378	93	80.3%
9. I think the following methods are effective in managing the psychosocial issues experienced by AI patients:			
i. Self-awareness	39	432	8.3%
ii. Motivation	26	445	5.5%
iii. Counseling	40	431	8.5%
iv. Socializing	11	460	2.3%
v. Peer support	6	465	1.3%
vi. All of the above	305	166	64.8%
10. An AI patient does require a multidisciplinary team approach for comprehensive care and management of the condition.	421	50	89.4%
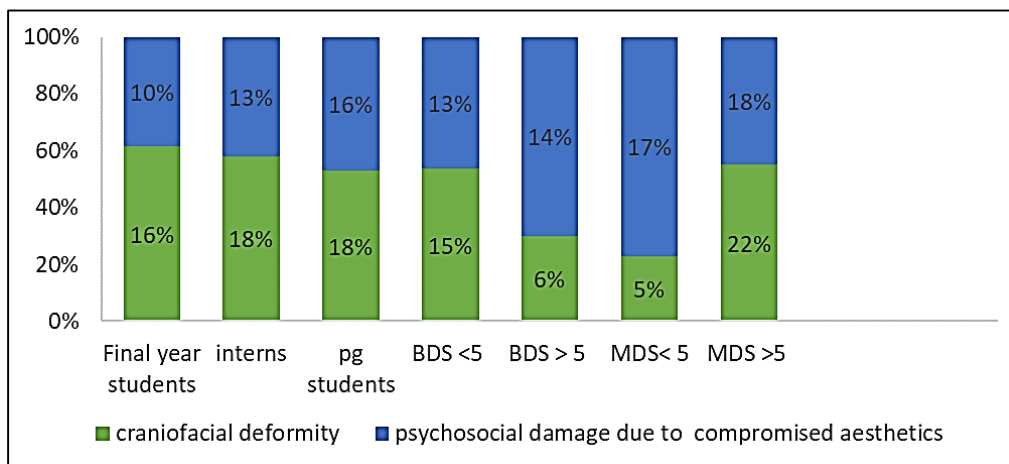
Figure 1: The bar diagram highlights awareness of craniofacial deformities and psychosocial damage in Amelogenesis Imperfecta (p < 0.05).
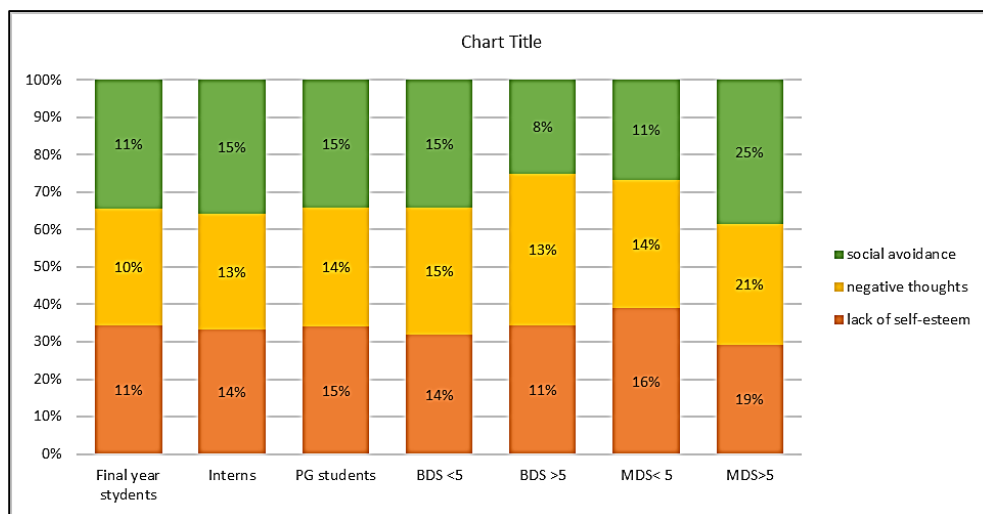

Figure 2: The bar graph shows significant awareness of psychosocial issues in Amelogenesis imperfecta, including lack of self-esteem (p = 0.014), negative thoughts (p = 0.012), and social avoidance (p = 0.009.
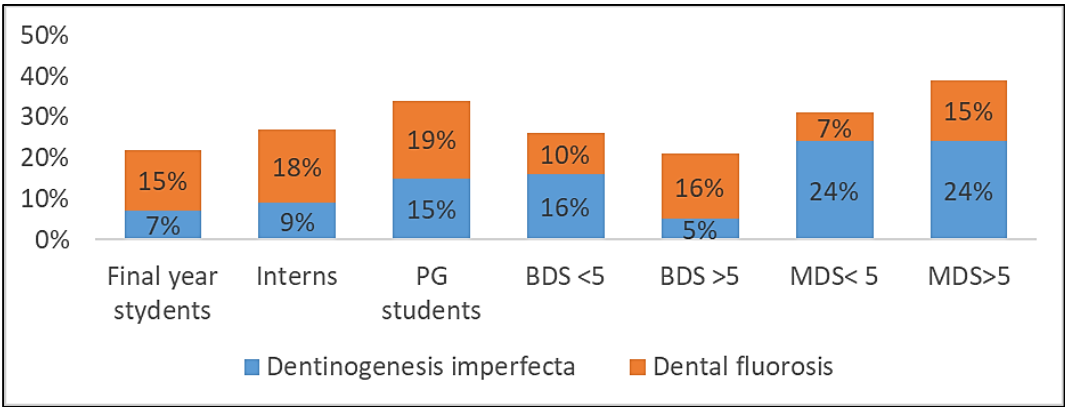
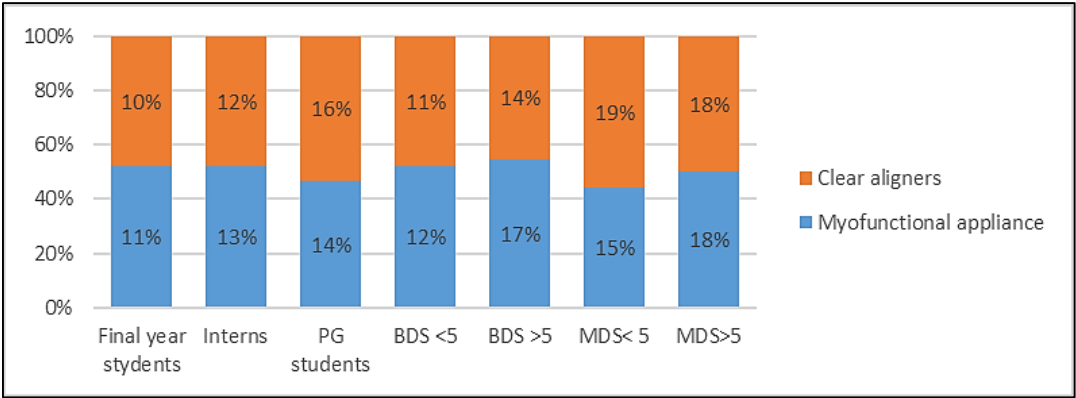**Figure 3:** Challenges in differentiating AI from dentinogenesis imperfecta and dental fluorosis

Figure 4: Preferences for clear aligners and Myofunctional appliances (p value = 0.030 for appliances, p value = 0.039 for aligners)
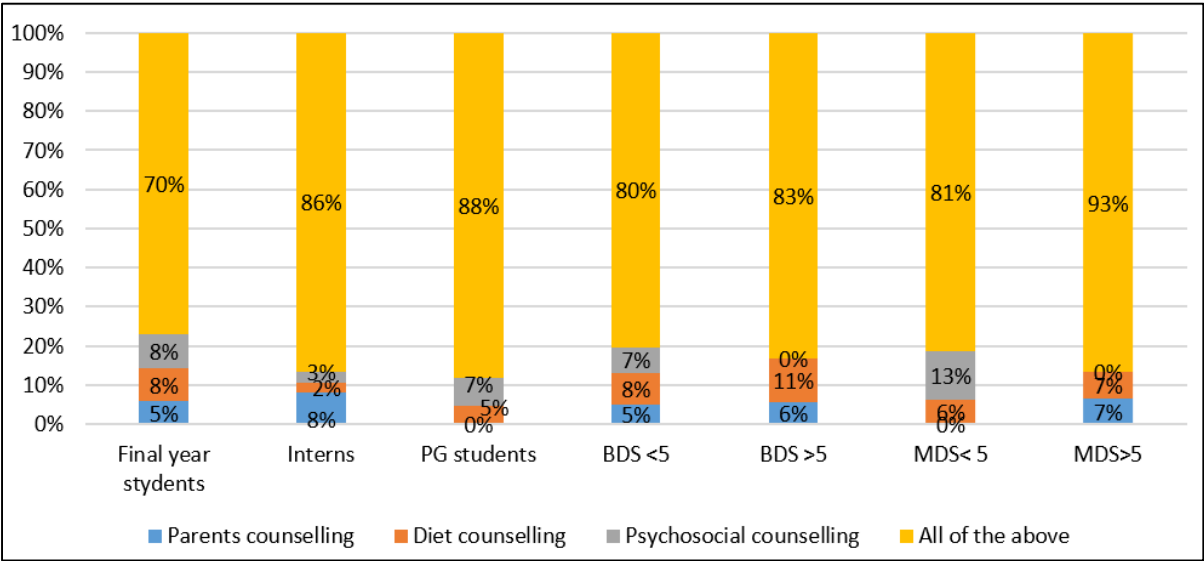

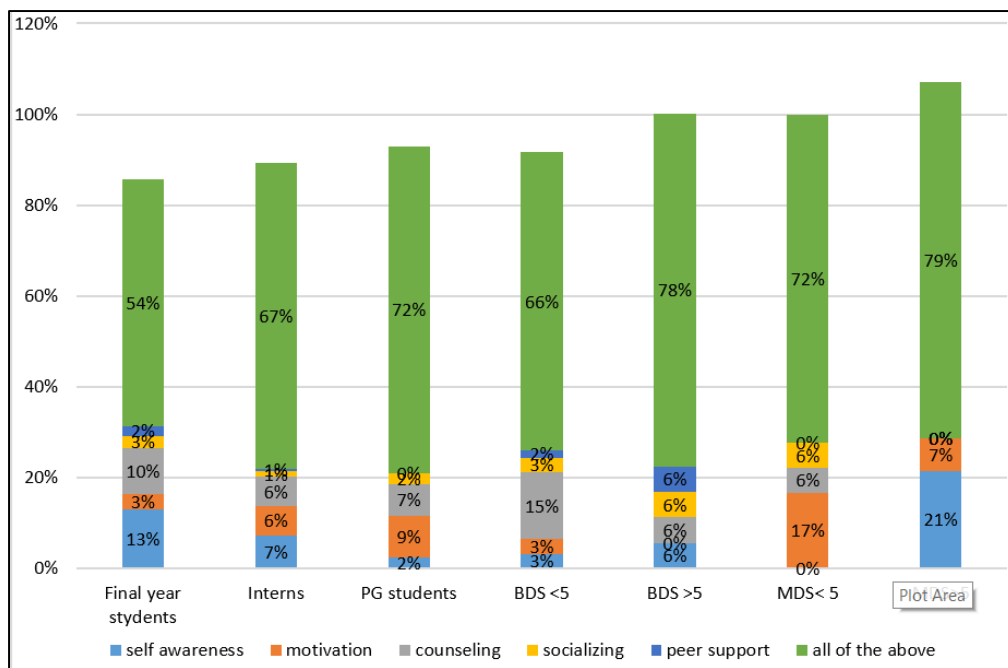**Figure 5**: Preferred counseling tools in AI patients. (Pearson chi-square = 15.882, p = 0.014).

Figure 6: Preference for holistic psychosocial management of AI (p value = 0.041) Pearson chi square value- 13.118.

4. Discussion

Dental anomalies that impact aesthetics are frequently encountered by dentists in routine practice. Many patients with such conditions face significant psychosocial challenges, which are often overlooked in dental care. This study aims to evaluate the skills and confidence of dental professionals in diagnosing and managing Amelogenesis imperfecta (AI) and to assess their awareness of the psychosocial needs of these patients.[8,9]

Differentiating disorders and distinguishing them from similar conditions is a crucial clinical skill. While 87.3% of respondents expressed confidence in diagnosing Amelogenesis imperfecta (AI), 24.8% reported difficulty in differentiating AI from conditions such as dentinogenesis imperfecta and enamel hypoplasia. Notably, a higher level of confidence in diagnosis was observed among participants with greater clinical experience.[10] (**Figure 3**).

Awareness of various dental and skeletal malocclusions was evaluated in the study, revealing that participants were more adept at recognizing dental issues, such as open bite and crossbite (P-value = 0.805), compared to skeletal issues, such as a retrognathic mandible (P-value = 0.033) (**Figure 1**).

Orthodontic appliances are essential for correcting malocclusions, aligning bites, and enhancing the aesthetic appearance of the dentition. However, due to the compromised enamel structure, conventional orthodontic treatment with braces may not be feasible in many cases. Early intervention with orthopaedic appliances, such as functional appliances or modern options like clear aligners, can effectively manage skeletal discrepancies while improving facial and dental alignment.[11,12] Interestingly,

75.4% of participants acknowledged this as a practical approach for treating patients with Amelogenesis imperfecta (AI) (**Figure 5**).

Evaluating the awareness levels of psychosocial effects on patients was a key component of the study. Factors such as lack of confidence (P-value = 0.531), low self-esteem (P-value = 0.014), anxiety and social avoidance (P-value = 0.009), and negative thoughts (P-value = 0.012) were assessed, highlighting issues often overlooked in dental care.[13] (**Figure 2**).

The psychosocial impacts of Amelogenesis imperfecta (AI), particularly in children and adolescents, can lead to emotional disturbances and social withdrawal. Studies by Coffield and Marks emphasized that individuals with AI often experience negative self-perception, anxiety, and fear of social judgment, significantly affecting their quality of life.[14]

Psychosocial support should encompass self-awareness, motivation, counseling, peer support, socialization, and specific interventions such as dietary counseling, parental counseling. Healthcare professionals must recognize these tools and apply them appropriately to support their patients. In this study, 89.3% of participants identified all the above psychosocial support tools as an essential component of effective treatment for patients with Amelogenesis imperfecta (AI) (**Figure 6**). Addressing these psychosocial challenges alongside the physical management of AI can significantly improve overall well-being and contribute to better long-term outcomes for these patients.[15]

5.   Conclusion

The study highlights the need for early diagnosis and patient-centered care to minimize the psychological burden and improve outcomes for AI patients. Integrating psychosocial management strategies into dental education and clinical practice will ensure that future professionals are well-equipped to meet the needs of these patients. This research serves as a foundation for further studies and initiatives aimed at enhancing AI awareness and patient care in Kerala. The study's reliance on self-reported data may introduce bias, as participants might overestimate their knowledge. Additionally, uneven sample distribution across groups limits the generalizability of the findings. Future research should consider a larger, more balanced sample and explore qualitative insights to deepen understanding of both clinical and psychological aspects of AI management. This research underscores the need for professional training to equip dentists with the skills to deliver effective clinical solutions and empathetic support, improving the quality of life for AI patients.

6.   Source of Funding

7.   Conflict of Interest

None.

8.   Acknowledgments

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