

# **ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE IN MINIMAL INTERVENTION DENTISTRY IN A GROUP OF DENTAL INTERNS**

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## **Abstract**

**Background:** Minimally invasive dentistry (MID) encompasses early caries diagnosis through caries risk assessment, early detection of incipient carious lesions including primary and secondary prevention based on scientific evidence that remineralization of demineralized enamel and dentin is possible if detected early. Although the dental curriculum focuses on the advantages of MID in tooth preservation, this science is not usually translated into practice.

So, this study aims to evaluate the knowledge, attitude and practice of minimal intervention dentistry among a group of dental interns.

**Materials and methods:** A questionnaire based survey which consists of 14 questions was used for the study. The descriptive survey was conducted among 232 dental intern students. Results were entered in Microsoft Excel and analysed using SPSS software version 23.0. Descriptive and inferential statistics were employed to report the responses.

**Results:** Majority (98%) of the dental interns were aware of MID. About 97% and 80% have adequate knowledge about pit and fissure sealant application and fluoride application respectively. But only 38% and 29% have practised slot preparation and chemomechanical caries removal methods. According to the statistics, there is no significant difference between gender and the practice of chemomechanical caries removal methods. (Chi-square; p value = 0.06, not significant).

**Conclusion:** Interns exhibited adequate knowledge and positive attitude which they acquired through their undergraduate curriculum, but it did not create positive behaviour towards practising MID. Hence, it may be suggested that there ought to instil positive behaviour among students in order that they practise MID routinely.

**Keywords:** minimally invasive, interns, dental caries, innovative technique, dentistry

## **INTRODUCTION:**

A surgical approach to caries control is vital because the primary line of defense doesn't eliminate the rationale for disease but leads to a seamless process of replacement dentistry, wherein the cavity gets larger and thus the tooth gets weaker [1]. This recognition of this factor led to the emergence of MID [2] which is based on the observation that demineralized hydroxyapatite tends to remineralize when given a favourable local environment. When demineralizing factors overwhelm the remineralizing factors, carious lesions occur[3]. Furthermore, no restorative material is almost as good as the enamel-dentin. Therefore, preserving and conserving the tooth structure is important. Dawson and Makinson elaborated on this innovative approach for caries "Minimal Treatment" given by Mount and coined the term "Minimal Intervention Dentistry." [4 - 6]

The primary focus within the minimally invasive model of caries management is identifying and eliminating the causative factors and repairing the damage caused by carious lesions [7]. Caries is now viewed as an infection rather than as a lesion and its treatment objective is to reduce or eliminate pathogens, this will be viewed as a departure from the traditional restorative model[8]. The minimally invasive model synthesises knowledge of the disease process into a simple conceptual model using new technologies [9]. The minimally invasive model of care addresses the first carious lesion and thus the causes of the disease process[ 10]

MID includes the subsequent principles; early caries diagnosis and assessment of caries activity, the classification of caries depth and progression using radiographs, the assessment of individual caries risk (high, moderate, low), the arresting of active lesions, the remineralization and monitoring of non-cavitated lesions, the position of restorations in teeth with cavitated lesions using minimal cavity designs, and assessing disease management outcomes at pre-established intervals[11]. The MID philosophy consists of varied kinds of techniques which include hand instrumentation, chemomechanical caries removal, air abrasion, and laser cavity preparation [12]. Atraumatic Restorative Technique (ART) involves hand instrumentation technique which is based on removing the infected layer and maintaining the demineralized dentin to arrest the caries progression (Massler's theory) while using the healing potential of glass ionomer cement (GIC) to remineralize affected dentin [13]. MID advocates use of adhesive dental materials that are associated with conservative cavity preparations because these materials don't require mechanical retention; instead, they believe the adhesive process to bond to the tooth structure[14–16].

With time there has been progression in research leading to changing concepts of cariology in terms of pathogenesis of cavity , transmission, the demineralisation-remineralisation cycle and with the arrival of newer technologies in biomaterials, equipments used for the detection of carious lesions and various methods for cavity preparation. This scientific basis of data when combined with the technological and technique related developments, imply that the legit therapeutic model is that the one supported prevention and treatment of cavities , using the smallest amount invasive of all approaches. This model of care with a rational approach is known as minimal intervention dentistry[16]. A robust decision is required to analyse the patients at risk and then treat them appropriately with the available cost effective procedures[17]. Decision making in dentistry is complex . The decisions that are made are often based on their knowledge from training experiences and a combination of personal, patient and practice factors. The treatment philosophy a dentist adopts is presumably a result of dental school training practice experience, and continuing education[18]. Our team has extensive knowledge and research experience that has translated into high quality publications[19–38] So, this study aims to assess the knowledge, attitude and practice in minimal intervention dentistry in a group of dental interns.

## **MATERIALS AND METHODS**

A cross sectional study was done among the dental interns in Chennai city through online google forms. The survey consisted of 14 semi-closed pre-validated and reliable questionnaires based on knowledge, attitude and practice on minimal intervention dentistry. A total of 232 dental interns participated in the survey. The people involved in the study were two, one investigator and one principal investigator. All the dental interns who were willing to participate in the study had been included in the study.

Oral consent from the participants had been obtained after explaining the need for the study. Prior approval to carry out the study was obtained from the Institutional Research Committee (IRB) of the author University. The pros of the study is that it was done through online google forms and it was less time consuming than offline surveys. The cons of the survey is that it took place in only one geographical area (Chennai city). Data was collected and analysed using SPSS version 23.0 software. Descriptive and inferential statistics were performed to report the responses of the parents.

## **RESULTS:**

A survey was conducted among 232 dental interns in Chennai city. About 34% and 66% of the dental interns were male and female respectively (Figure 1). Among them, 98% knew about Minimal Intervention Dentistry and 2% didn't know about MID (Figure 2). Out of that, 97% think that pit and fissure sealants are beneficial (Figure 3). About 80% think that fluoride application is an effective way of preventing dental caries (Figure 4). About 38% claimed that they have done slot preparation in their practice and about 62% haven't done slots prescribed in their practice (Figure 5). About 29% claimed that they have done a chemomechanical caries removal method in their practice and about 71% haven't done a chemomechanical caries removal method in their practice (Figure 6). About 51% seals the adjacent pits and fissures of composite restorations with a sealant [Figure 7]. The association of the gender with the knowledge about fluoride application is shown in [Figure 8]. The association of the gender with the practice on chemomechanical caries removal method used is shown in [Figure 9].

## **DISCUSSION**

The focus on prevention and early caries detection has paved the way for the concept of minimal intervention dentistry (MID). A treatment philosophy based on the medical model which incorporates assessment of the risk of disease, early detection and prevention; remineralization of tissues; use of a variety of dental materials and equipment and surgical intervention when necessary or only when the disease has been controlled [39]. The principles of MID seek to convert an active lesion into an inactive or arrested lesion, thus aiding the defence and healing processes in dentin and pulp before restorative procedures are attempted [40].

In a study conducted in Karnataka, 97% of dentists were aware of MID [41]. Similarly, in our study, 98% of the dental interns knew about MID. A study done by Rayapudiet al., [42] stated that 91.3% agreed that pit and fissure sealant is effective in permanent teeth, only 76.4% agreed to its effectiveness in primary teeth. Another study by Suma et al., [43] stated that 81% of the dental professionals agreed that pit and fissure sealants are beneficial. Similarly, in our study 97% stated that pit and fissure sealant is beneficial.

A study conducted by Bhat et al.,[44] stated that 76% agreed that fluoride is effective in preventing dental caries. In our study, 80% thought that fluoride is effective in preventing dental caries. Our study findings are in concordance with the literature. A study by Gupta et al., [17] stated that 58% have done slot and tunnel preparation in their practice. Our study stated that only 38% have done slot preparation in their practice. This states that although they have adequate knowledge about MID, when it comes to clinical practice, they fail to use it.

The limitation of the study was that the knowledge, practice and attitude on minimally invasive dentistry was observed with the fact that the subjects examined represent a selected population. Future studies can be done with larger sample sizes and in a varied population.

## **CONCLUSION**

The study reveals that the knowledge and attitude on minimally invasive dentistry are adequate but it did not influence the clinical decision making behaviour or practicing MID. Education and practice should move toward a medical model of caries management with due respect to early detection, prevention, and prescription dentistry.

## **AUTHOR CONTRIBUTIONS**

Author 1: Sagana M, carried out the study by collecting data and drafted the manuscript after performing the necessary statistical analysis and in the preparation of the manuscript.

Author 2: ArthiBalasubramaniam, aided in conception of the topic, designing the study and supervision of the study, correction and final approval of the manuscript.

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## **CONFLICT OF INTEREST**

Author declares no potential conflict of interest

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