

UNIVERSITI TEKNOLOGI MARA

**IDENTIFICATION OF
ASSESSMENT FACTORS
FOR MANAGING POOR PROGNOSIS
FIRST PERMANENT MOLARS
IN CHILDREN:
A MULTI-PHASE CONSENSUS STUDY**

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ABSTRACT

The management of poor prognosis first permanent molar (FPM) in children can be challenging because it depends on several modifying factors that must be considered, and each treatment approach has its own implications and clinical outcomes. With the current updates of scientific evidence, there are numerous options of treatment approaches for poor prognosis FPM, including preservation of the tooth by restorative or endodontic treatment or elective extraction followed by orthodontic management. The existing guidelines on the management of poor prognosis FPM predominantly focus on specific perspectives, such as orthodontics, which impedes comprehensive evaluation and assessment in managing these cases with minimal adverse outcomes in paediatric patients. To ascertain the optimal treatment approach for young patients, it is essential to evaluate the factors that influence treatment outcomes. Achieving the best treatment outcome with a holistic approach requires expert healthcare providers to share their understanding and experiences pertaining to this matter. A comprehensive assessment of the management of poor prognosis in FPM should also encompass orthodontic, restorative, and paediatric dentistry points of view. To date, there is no available checklist that can be used especially for dental frontliners to facilitate their management. Therefore, this study aimed to identify and structure assessment factors to support the future development of a clinical decision-making tool for managing poor prognosis FPMs in paediatric patients. A three-phase approach was employed: a scoping review to identify relevant factors from the literature, followed by focus group discussions (FGDs) with paediatric dentists, orthodontists, and restorative specialists to explore and refine these factors, and finally, a Delphi consensus process involving paediatric dentists to achieve agreement on item inclusion. The initial 35 items identified were reviewed over two Delphi rounds, resulting in 34 items reaching expert consensus. These items were categorized into three domains: tooth-related, child-related, and treatment-related factors. Although this study provides a structured foundation for a potential assessment checklist, the tool has not been piloted or tested in clinical settings, particularly with general dental practitioners. Future research should focus on validating its practical usability and integration into routine care. Upon validation, this tool could standardize clinical assessment, enhance referral decision-making, and improve interdisciplinary treatment planning for children with compromised FPMs.

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CHAPTER 1

INTRODUCTION

1.1 Research Background

The first permanent molar (FPM) is the first permanent tooth that erupts into the oral cavity. The formation of FPM begins as early as the prenatal stage, with initial calcification starting around the fourth fetal month (Almuallem & Busuttil-Naudi, 2018). This protracted developmental process continues after birth, culminating in full eruption at the age of 6 years, and occlusal functionality by early childhood. Their early emergence and strategic positioning at the back of the dental arch makes them pivotal in maintaining arch integrity and guiding the eruption of subsequent permanent teeth. On the other hand, FPM is vulnerable to both caries and developmental dental defects at an early age.

Data from the Office of National Statistics in the United Kingdom (UK) states that 5% of 8-year-olds and 25% of 15-year-olds have some form of caries in their FPMs (UK Government, 2015). A local university in Saudi Arabia further reported that, in the age group of 7-15 years, 37% of patients had at least one missing FPM (Almugla, 2021). In Malaysia, only 82.7% of FPM in children aged 7-10 years old were caries-free (Bakri, 2020).

Molar Incisor Hypomineralization (MIH) is a common dental developmental condition that affects the FPMs. Epidemiological statistics have revealed a broad range of MIH prevalence worldwide, ranging from 2.9 to 44% (Elfrink et al., 2015). According to a recent systematic review, the mean prevalence of MIH is 13.1% (Schwendicke et al., 2018b), whereas in Malaysia, 16.9% of children aged 7-12 years old were reported to have MIH (Hussein et al., 2015).

At an early age, children with developing dentition may present with one or more FPMs with a poor prognosis due to extensive caries, developmental defects such as MIH, or a combination of both (Cobourne et al., 2014). A poor prognosis FPM is typically defined as a tooth that, despite possible restorative or endodontic intervention, exhibits a compromised long-term outlook due to extensive structural loss, repeated